App. F. IX—4

Previous References.

1957. (PWD)

File No. PWD 1

*Serial Nos.

Later References.

MYSORE GOVERNMENT SECRETARIAT

Serial Nos. Public works Department

Major Irrigation

Part B for

SUBJECT

Alignment of Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel for Crossing Shantisagar Valley.

WD 03758—GPB—50,000—10-10-58

Ashok Kumar 5/3/59

Maybe preserved. CJL 13/12/85 WB Tech-II.

Issued 28/4/59 5/3/59

...T SECRETARIAT
87/59
29 JAN 57
PUBLIC WORKS BRANCH

PWD 14 BD 57

Proceedings of the Preliminary Meeting of the Standing Technical Advisory Committee held in the Chambers of the Chief Engineer, Major Irrigation (South), Bangalore, on 29th December 1956 at 9-30 A.M.

---

xx xx xx

PUBLIC WORKS BRANCH
MYSORE GOVT. SECRETARIAT
29 JAN 1957
No.

(7) Alignment of the Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel for crossing Shanti Sagar Valley.

---

x x x

MYSORE GOVERNMENT SECRETARIAT
No. 1459
29 JAN 1957
PUBLIC WORKS (MAJOR IRRIGATION BRANCH)

After some more discussion, it was resolved as follows:-

(1) Trial pits every half a mile should be taken on both the Malebennur and Davangere Contour alignment to assess the exact nature of the soil and to provide correct rate as per classification of soil as against the rates assumed, which the Members of the Committee, felt as very high.

(2) Estimates should be correctly prepared for the contour channel.

(3) All the other information which the Members of the Committee desired during their discussion, has to be furnished.

The Chief Engineer, Major Irrigation (South) was requested to furnish all the information within one month, for which the Chief Engineer assured that it would be done.

This was taken up at the main meeting of the S.T.A.C. held on 30-12-1956 and the decision taken at the preliminary meeting was confirmed.

~~The Chief Engineer, Major Irrigation (South) may be asked on 30-12-56 and the decision taken at the preliminary meeting was confirmed.~~

The Chief Engineer, Major Irrigation (South) may be asked to furnish the particulars referred to above required by the Committee immediately so that further action may be taken for arranging inspection or meeting by the Members of the S.T.A.C.

29/1 4 (Asst Secy MI)

(MI) immediately

29/1

Extract from the proceedings of the S.T.A.C held on 2nd Dec 56 - Alignment of the Bhava Right Bank Channel beyond Hirevankali Tunnel for Crossing Shanti Sagar valley. 1459/pwng (WD14BRRS)

---

6) A draft letter to C.E is put up for approval

Issue 30/1/57

✓ For perusal before issue

Dy Secy (Gen)

Issue

BM

31.1.57

KR 30.1.57

KR 31.1.57

Issue No (WD)14-BRR-57 dt 7.2.57 to the C.E, M.I.S.

9) A draft reminder letter to the CE (WRS) for Rs 3 x 10^5 is put up for approval

14/2

10) Issue

K

14/2

11) A draft reminder letter is put up for approval

23/2/57 23/2/57 12 Issue today

KR 23/2/57

13) A draft letter to the CE (WRS) is put up for approval

11/3

11/3/57

14) Issue

11/3

Issued in WD)14 BRR/57 dt 12-3-57

Extract from the proceedings of the S.T.A.C held on 29/4 Dec 56 - Alignment of Bhadra Right Bank beyond Hevenadi Tunnel for evening Shankarsagar valley

PWD 14 13 R/S 57

Received Memo No 50023 dated 11-3-57 from the Chief Engineer, Major Irrigation Projects a copy of set of particulars regarding the above subject —

15) 11 sets have already been sent to the Secy S.T.A.C. This may also be referred to them for taking necessary action.

16/3/57 16/3/57

16) Under Secy P.W.D (Secy S.T.A.C)

For favouring remarks

KR 19.3.57 As Proc

Committee clerk

17) These 11 sets from SCE MTS and another 11 sets also from the SE TBP circle have already been distributed among the members also. Only the preliminary meeting is to be fixed soon as early as possible perhaps a week's time

25/3

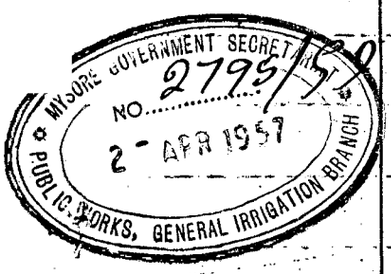
Mysore Government Secretariat

Alignment of Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel for crossing Shantisagara Valley. [App. F. III 2

File No. of 195 .

PWD 14 BPH 57

Serial No.



(18) In the file Correspondance is placed the resolution of the S.T.A.C passed at their preliminary meeting held today (2-4-57) in the office of the C.E. M.I.S. Though final decision re: the main alignment has not been taken, there is an unanimous agreement with regard to taking up the excavation of the length of about 2 miles (A C D) from the tunnel exit. This has been ratified at the main meeting also presided over by the P.W. Secy who is the Chairman of S.T.A.C. Pending that ratification Govt approval may perhaps be accorded to as, I am given to understand this is not much work & the Survey and Designs Division otherwise.

A

Asst Secy M.I.

Helper
Secy S.T.A.C
2/4/57

(19) Appl of Govt may be accorded for taking up the excavation work of the channel of about 2 miles in length as marked A-C-D, in the index plan at page 13/c.

Dy. Secy

RTO.

Note.—Contn. Sheet

Alignment of Bhadra Reservoir Right Bank channel beyond Hirenalali Tunnel for crossing Sandal Soap ...

File No. PWD 14 BRB 57 of 195 /.

Mysore Government Secretar

Serial No.

1) The resolution of the S.T.A.C. at its preliminary meeting held on 2nd April 1957 is at page 11A12Cf. It is seen that C.E. (Q) and C.E. (M.D.S) were both present. Retired C.Es were also present. It is stated that all the members agreed that the alignment ACD from the exit (point A) of the tunnel vide index plan should be adopted. The C.E. (Q) and C.E. (M.D.S) are parties to this opinion. We may accept this. (There is no indication as to the cost of the alternatives in regard to the alignment)

B.S. Srikantaiah
5.4.57
Dy Secy (PWD)

Secy (PWD)

2) For approval

Min. PW

5/4/57
(Secy PWD & Elec)

THE MINISTER FOR PUBLIC WORKS
No. F.17
5 APR 1957
BANGALORE

3) 9/4

Sahu
BM 10/4/57

4) 10.4.57

9/4/57

WD-05450-GPB—P. Z. S.—80,000—21-8-56.

Mysore Government Secretariat

Alignment of B.R. Right Bank channel beyond Haveneli Tunnel

File No. PWD 14 BAI 57 of 1957.

[App. F. III 2

Serial No.

24) A draft G.O is put up for perusal

10/4/57 10/4/57

25) For perusal before issue (Draft G.O. at page 30 c/f) 11/4/57

Dy Secy

26) Re-type as corrected

11/4/57

27) Typed Copy is at page 31 c/f.

11/4/57 Issue 11/4/57

Issued in No. PWD 14 BAI 57 dt. 17th April 57

To

The Chief Engr(s) Bijapur (N. plains)

The Secretary

Dy Secy to Govt PWD

28) This may be submitted to the Secy P.W. for perusal after issue

16/4/57 19/4/57 For perusal

Dy Secy Secy

24) 19/4/57

19.4.57

20/4

30) 20/4/57

24/4/57

SECRETARY TO GOVERNMENT PUBLIC WORKS & ELEC. DEPTT. Date 20/4/57

Note.—Contn. Sheet

Alignment of Bhadra Rest Right Bank Channel beyond Hiremalali Tunnel - -

File No. PWD 14 BRP of 1957.

Mysore Government Secretariat

Serial No

31) The file now may be referred to the Secy S.T.A.C for taking further action at 'A' at para 18 of the notes. - -.

22/4/57 Sms 22/4/57

U/S. P.W.D. (Secy. S.T.A.C) 32) For the needful

KA 23/4/57 A.S. P.W.D.

33) Papers for the next meeting of STAC 16 28/4

34) Extracts of decisions of the thirty-third meeting of the Standing Technical Advisory Committee, held on the 10th July 1957 in the Chambers of the Minister for Public Works.

Item No.4: Alignment of the Right Bank Channel beyond the Hiremalali Tunnel.

"The common portions of the works relating to several alternatives before the Committee, namely the work on the main canal upto the point R1 in the Plan and the Malebennur Branch Channel from the point R2, about which there is unanimity of opinion among the members may be proceeded with".

35) In G.O. No.PWD 14 BRP 57, 17th April 1957 it was directed that the alignment ACD from the exit (point A) of the Tunnel as indicated in the index plan should be adopted and the work on this portion may be taken up for execution, Pending final decision on the alignment of the channel to cross the 'Shantisagar Valley' from the point D onwards.

BAP - Alignment of the Right Bank channel beyond Hiremalali Tunnel.

Mysore Government Secretariat

File No. 14 of 1957. PWD (BAP)

[App. F. III

Serial No.	
	The question was again considered at the 33rd meeting of the S.T.A.C. held on 10th July 1957 and a decision has been taken which is extracted above which may please be seen. In the circumstances the decision of the S.T.A.C. is for approval.
	13/7/57 13/7/57 36) Orders of Govt. have already been issued for taking up the work of the channel in the portion A C D, from the exit point C of the tunnel. Further orders of Govt will have to be issued now for taking up the work beyond the point D, in accordance with the decision of the S.T.A.C. held on 10.7.57. The main channel from D to R_1 and the Malebenna branch channel beyond R_2 may be continued in the higher contour with reference to the level ~~of the bed~~ realised at the tunnel exit. As there is unanimity of opinion among all the members of the S.T.A.C. for taking up the work on these portions of the channel, the proposal, as recommended by S.T.A.C. may be approved.
Index plan at 13 C F	13 C F

SECRETARY TO GOVERNMENT Date 19.7.1957 PUBLIC WORKS & ELEC. DEPTS.

D/s pwd

13/7/57

37) May be approved

Secy (PW)

13/7

38) Min: PW

D. K. SRINIVASACHAR
Secy. P. W. & Elec. Depts.

OFFICE OF THE MINISTER FOR PUBLIC WORKS No. F. 1179 JUL 1957 BANGALORE

39) 17/7/57

40) 17/7

17/7/57

Note.—Contn. Sheet

Alignment of the RB Channel beyond Hemmalali Tunnel

File No. PWD 14 RBN of 1957.

Mysore Government Secretariat

Serial No.

41) A draft G.O is put up for appl.

19.193

18/7 SN. 18/7/57

For Council before Govt

Dfs (PWD)

18/7/57

42) The Preamble may be a little elaborate, indicating the Council's and to begin appl. as discussed

18/7

43) A modified typed draft is put up

18/7/57

For appl.

Dfs (PWD)

19/7/57

44) Some slight modifications in draft & new draft is put up for formal Govt sanction

Sanction

45)

19/7

45) Please it is issued in 22nd (revised)

Asst M.T.)

20/7

Issued 22/7/57

WD-05450-GPB—P. Z. S.—90,000—21-9-56.

Mysore Government Secretariat

File No. PWD 25 S A C 57 of 195 [App. F. III 2

Serial No.

47) I place below the proceedings of both the 33rd and 34th meetings of the S.T.A.C. The proceedings of the 33rd meeting has already been confirmed but the proceedings of the later meeting is yet to be confirmed.

48) I am to request the Under Secretary, Major Irrigation to take necessary further action in respect of the several decisions taken by the S.T.A.C., particularly regarding the following schemes:-

(a) Chikkahole, Hebbala and Agrabommanahally schemes.

The S.T.A.C. were not able to take a decision as can be seen from the proceedings regarding the alignment of Davangere Branch channel to cross the Shantisagar Valley. But the discussions that took place are indicated in a very detail in both the proceedings. Government will have to take decision with regard to the selection of the most suitable alternative.

MYSORE GOVERNMENT SECRETARIAT NO. 7369 1957 PUBLIC WORKS MAJOR IRRIGATION BRANCH

Under Secy. M.I. 26/10

Under Secy. M. I. Proj.

49) (A) Extracts pertaining to Chikkahole, Hebbala and Hagaribommanahalli Schemes may be taken and forwarded to the CEs concerned for taking further action on the lines suggested by the S.T.A.C.

As regards the alignment of Davangere branch channel to cross Shantisagar valley, the file may be put up after attending to the work at (A) mentioned above.

Extracts have been taken Sir. 28.10.57

CW will open separate files for each of the projects.

Separate files are being opened and action will be taken.

Note.—Contn. Sheet

Bhadra project – Alignment of the Bhadra Right Bank Channel for crossing the Shantisagar valley

File No. PWD 14 BRP of 1957. Mysore Government Secretariat

Serial No.

50) No definite or unanimous decision was arrived at the meetings of the Standing Technical Advisory Committee held on 10.7.'57 and 21.10.'57, regarding the alignment of the Bhadra Right Bank Channel (Davangere branch) to cross the Shantisagara valley. There were two distinct views held by the members. One was that the channel should be taken by means of an R.C.C. trough or duct over the bund; the other was to take it by means of an aqueduct or a syphon behind the bund. Now, Govt. will have to take a final decision in the matter, keeping in views the opinions expressed by the members of the Committee.

51) In this connection, it may be pointed out that the Irrigation and Power team on plan projects set up by the planning Commission, Govt. of India, that visited the Lakkavalli project during the month of May '57, had an informal discussion with the members of the S.T.A.C. at the Residency. The team had expressed their views in favour of the duct proposed and they had, therefore, suggested that the S.T.A.C. members might consider this proposal along with the other alternative alignments. Subsequently, soil tests were conducted on the existing Shantisagara bund and it was found that the bund consisted of only loose earth and boulders, up to a depth of 20–25 ft. It is after the results of these tests were made

WD-0136 –GPB—P. Z. S.– 80,000 –21-4-57.

Serial No.

Known to all the members of the S.T.A.C, this Subject of the alignment of the Right Bank channel (Davangere branch) to cross the Shantisagara Valley, came up for discussion again before the S.T.A.C.

52) The proceedings of the two meetings of the S.T.A.C. referred to in para 51 above, are placed below for perusal. The recent letters of Si. M. Narasimhaiya, one of the members of the Irrign & Power team, addressed to the Secy PWD. on the same Subject, may also be perused. Out of the twelve technical members of the S.T.A.C, Six members viz, Messrs M. Narasimhaiya, M.G. Rangaiah, V. Ganesh Iyer, N. Neelakantappa, N.N. Iyengar and K.S. Gangadhara, were in favour of the duct proposal, while the remaining Six members viz, Messrs B.S. Narasinga Rao, M.N. Lakshmana Rao, H. Anantachar, T.S. Moorthy, C.R. Krishnaswamy Mudaliar and J.L. D'Sa, were against it, for the reasons stated by them, as can be seen from the proceedings of the two S.T.A.C meetings cited above. At the thirty-third meeting of the S.T.A.C, Secy PWD. remarked that it was understood during the discussion that the Syphon proposal could be made fool-proof, whereas the alternative duct proposal was open to risk, and he said that the question to be considered was whether from the technical stand-point a fool-proof method should not be preferred to the alternative which involves certain amount of risk.

53) Taking all the aspects of the Problem

Flags 'K' & 'L'

Flag 'N'

* This is not quite correct. Gangadhara seems to be of the view that if quick execution is the criterion, tendering for repairs to sluices, bund etc. of tanks could be taken up immediately and direct labour could be employed for completion of the work by the end of the dry season which is the period available for the investigations, and thereby quicker completion and benefits of the proposal could be secured. So far as the syphon proposal was concerned, it would take itself for completion of the work mentioned and scheduled here, given normal conditions.

7/11/57

Bhadra project. Alignment of the Right Bank channel for crossing the Santhisagar valley.

File No. PWD 14 IBRP of 195 7.

Mysore Government Secretariat

Serial No.

into consideration, I feel it is desirable to take the channel by means of a suitable structure (preferably, a syphon), behind the bund rather than taking it over the bund for the following reasons :—

(i) The element of risk is there in both the proposals, as argued by some of the members. But, the amount of risk involved in the duct proposal is comparatively very much. For instance, if there were to be a breach of the tank, then the entire duct would be completely washed away, and the necessity for the construction of a syphon or an aqueduct afresh, would again arise. But, in the case of the syphon, waters from the breached tank can just flow over the syphon, as the syphon could be kept in position by means of suitably designed thrust-blocks. There might be, of course, some little scours here and there at the bottom of the syphon, which can be repaired with ease. Even in the case of the aqueduct, the breached waters can just pass away beneath the channel.

(ii) The comparative statement of cost of the two proposals, as furnished by the S.E. in charge of the works, may pl. be seen. It is true that these estimates might have been got up purely on a rough basis and that during execution, there might be major

Flag 'X' (Linked file)

WD-0136 -GPB—P. Z. S.—80,000—21-4-57.

Bhadra - project - Alignment of the Right Bank channel for crossing the Bhadra Valley.

Mysore Government Secretariat

File No. PWB 14 BRP of 1957.

[App. F. III 2

Serial No.

deviations involving extra expenditure in either case. But, from the figures that are made available now, it can be seen that the difference in cost between the two proposals is negligibly small.

(iii) It is not at all desirable to adopt a proposal which involves considerable amount of risk, particularly at this important section of the channel. If there were to be any danger to the channel at this section, the entire ayacut of about 99700 acres, coming under the Davagere branch channel, would go without water and irrigation will get affected very seriously, as this form a major portion of irrigation under Bhadra project. Hence, even if the syphon proposal prove to be costlier than the duct proposal, it will have to be preferred, as cost should be no criterion, when safety is ensured.

(iv) It is true that the Irrigation and Power team of the planning commission were in favour of the duct proposal. But, at the time of their visit, soil tests on the bund were not conducted and they had not known about the results of these tests. If they had known, perhaps, they might have revised their opinion.

(v) Both the Deputy Chief Engineers of the P.W.D., ~~[illegible]~~, who are intimately connected with the execution of this scheme, have vehemently opposed the duct proposal, in view of the type of material with which the bund is made of. They may not be

Note.—Contn. Sheet

Bhadra project. Alignment of the Right Bank channel for crossing the Shanthisagar valley.

File No. PWB 14 BRP of 1957. 72½ pages

Mysore Government Secretariat

Serial No.

SECRETARIAT TO GOVERNMENT
NO 119800
7 NOV 1957
PUBLIC WORKS & ELEC. DEPT.

desirable to force on them a decision (purely technical in character), in which they have no confidence about its success, particularly so, when Govt can avoid such a situation.

54) If a decision were to be taken that the channel should be taken behind the bund, there will be again two alternatives, viz the Syphon and the aqueduct. We may perhaps leave this matter to the discretion of the CE(MII), who may be directed to examine the pros and cons of each and adopt whichever is found to be suitable.

K. B. Murarappa
6.11.57
K. B. MURARAPPA,
Under Secy., P. W. Dept.

D/s PWB
Secy PWB

55) I agree with the analysis in para 53. However as this is a matter in which technical officers themselves do not agree, we may leave the matter to the decision of C.E. (M.I.S.) who will be responsible for the execution of the work.

B. S. Srikantiah
7.11.57
Dy Secy (PWD)

Secy (PWD)

WD-0136-GPB—P. Z. S.—80,000—21-4-57.

Bhadra project. Alignment of the Right Bank channel - for crossing the Shantisagar Valley.

Mysore Government Secretariat

725 proc. File No. PWD 14 BRP of 195 7.

[App. F. III 2

Serial No.

7980

(56) Put up at the meeting of the Bhadra special committee. It is proposed that the Minister may inspect the place before a decision is taken

7/11

8/11/57

SECRETARY TO GOVERNMENT No. 14879 19 NOV 1957 PUBLIC WORKS & ELEC. DEPTT.

(57) Secy, Bhadra Special Committee & U/s. G.I.S

For information

K.L. 8/11/57

(58) Put up at the meeting of B.S.C.M. 17/11

(59) Inspection of the alternatives alignments by the Hon. PW and members of the Bhadra Reservoir Special Committee took place on the morning of 17.11.57.

The file is submitted for orders

Secy(PW)

18/11/57

(60) P.C. As may at the note

7/11

(61) The Minister for Public Works is aware of the discussions that have taken place at the meeting of the Standing Technical Advisory Committee about the alignment of the Bhadra Right Bank Channel across the Shantisagar Valley. Among the several alternatives that were originally thought of, only

Note.—Contn. Sheet

Bhadra project - Alignment of the Right Bank channel for crossing Shantisagar valley.

File No. PWD 14 BPJ of 1957.

Mysore Government Secretariat

Serial No.

two now remain for consideration. One is the construction of an R.C.C.Duct over the bund, and other the construction of a siphon or aqueduct across the halla behind the bund. The two alignments have also been inspected by Minister recently at the time of the meeting of the Bhadra Special Committee.

This is a matter which is purely technical in character and should originally be left to the technical officers for decision. Unfortunately, however, there has been no unanimity of opinion among the members of the Standing Technical Advisory Committee who were found to be almost equally divided between the two alternatives. What may be called the minority opinion of the Committee is supported by the Planning Commission Team for Irrigation & Power and appears to have the blessing of the Consultative Committee for Irrigation & Power set up by the Committee on Plan Projects. Even to a lay mind, the Shantisagar bund would appear to have been constructed not with any compacted material but with boulders and earth and debris thrown in without any consolidation. It also appears that although the second alternative of taking the alignment behind the bund is undoubtedly costlier by a few lakhs or perhaps several lakhs of rupees, it might be less open to risk. One of the members of the Standing Technical Advisory Committee, Shri. Neelakantappa, made the observation that even if the bund is found to be weak and leakages are noticed, this is the occasion to be made use of for the purpose of strengthening the bund, as obviously

WD-0136 -GPB—P. Z. S.—80,000—21-4-57.

Serial No.

we want the tank to be in a safe condition. An answer to this point was furnished by Shri.Gangadhara, another member of the Committee, to the effect that if the bund is to be made absolutely safe, or, at any rate, free from the kind of risk which is apprehended, the level of water in the tank will have to be first brought down below the cill of the sluices which can only be ~~secured~~ either ~~by depleting~~ when the tank is depleted or as a result of scanty rainfall over a period of years. At the moment, the tank is full and is discharging, and according to Shri.Gangadhara, if we are to wait until the tank is depleted to the level desired, we might have to wait almost indefinitely for taking the work on the tank.

Purely from the point of view of comparative safety, therefore, it would appear to a lay mind that the alternative of taking the alignment behind the bund should commend itself. As agreed by all members of the Standing Technical Advisory Committee, consideration of cost should only be secondary in such cases. But it seems to me that in this matter which should be decided on technical grounds, we should leave the decision to the Chief Engineer in charge, who will obviously have to take into consideration the opinions advanced on both sides. We may accordingly request the Chief Engineer to come to a decision on the basis of the opinion furnished and in the light of his own experience and knowledge.

As regards the question whether there should be a siphon or an aqueduct behind the bund, if the decision should be in favour of that alignment,

Note.—Contn. Sheet

Bhadra project - Alignment of the Right Bank Channel for crossing Shanthisagar Valley.

File No. PWD 14 BRP 57 of 195..

Mysore Government Secretariat

Serial No. 12879

we may leave that also to the Chief Engineer for decision.

(Mr: PW) 24/11/57

D. K. SRINIVASACHAR
Secy. P. W. & Elec. Depts.

OFFICE OF THE ... No. E-275

23/11

In our comm., we will also have to inform the Planning Commission Team of investigation tallies

28/11/57

26/11/57

Ref para 62-63. Addl D.O. to the CE may be put up for appl.

28/11/57. 28/11/57 pl. put up a typed draft

29/11/57

A typed draft is put up.

28/11/57.

For appl.

29/11/57

28/11/57

29/11

WD 01774—GPB—PZS—300,000—26-10-57

Bhadra project. Alignment of the Right Bank channel - for crossing the Shanthisagar Valley.

Mysore Government Secretariat

File No. PDO 14 BRP of 195 7.

[App. F. III 2

Serial No.

Receipt - D.O letter No P.C 230 dt 5.12.57 from the Chief Engineer Major Unnikrishna Souda Bangalore

70) (70) The D.O letter at page 5 1 c/f may please be seen wherein forces 61 - 69 ante. Under the circumstances stated the Chief Engineer has requested approval of Govt to the action taken by him in having instructed the S.E. Bhadra Tunnel circle to proceed with the work on the Davangere Branch channel behind the bund of Shanthisagar pending final decision on the alternatives either to cross by means of a Siphon or an aqueduct. Submitted for orders.

Ref - Pages 61 to 69.

8.12.57 9.12.57

72) Appl of Govt. does not deem to be necessary, as the entire issue was left to the discretion of the CE (NIS) and he was just requested to intimate Govt his decisions in the matter.

For perusal of the letter of the CE at page 5 1/c/f wherein the letter at page 4 9 c/f.

Dy (PWD)

9.12.57.

B.S. Srikantan
10.12.57
Dy Secy (PWD)

Secy (PWD)

73) The Minister mentioned to me on the 10th afternoon that Shri. Gadgil, Leader of the Planning Commission Team for Bhadra Project, had had a telephonic conversation with him that day about the alignment of the Bhadra Right Bank Channel

Bhadra project - Alignment of the Right Bank Channel for crossing the Shantisagar valley.

File No. PWD 14 BRP of 195).

Mysore Government Secretariat

Serial No.

across Shantisagar Valley, and the Minister desired that a note indicating the present position and the reasons for the decisions taken by the Chief Engineer in the matter may be put up for being forwarded to Shri. Gadgil. A note together with a draft letter (as from the Minister to Shri.Gadgil) is accordingly put up for consideration. The connected file is placed below and reference is invited to page 51 of the C.F. in at which the Chief Engineer has reported that he has decided on the adoption of the alignment behind the bund.

MINISTER FOR P.W.)

12/12/57

D. K. SRINIVASACHAR
Secy. P. W. & Elec. Depts.

SECRETARY TO GOVERNMENT
No. PW.11.46
12 DEC 1957
PUBLIC WORKS & ELEC. DEPTT.

OFFICE OF THE MINISTER FOR PUBLIC WORKS
No. 3063.
12 DEC 1957
BANGALORE

(74) 12/12

Letter issued.
No. M PW 1102/ 57 13/12/57

(75) 12/12/57

16/12/57

(76) orders as proposed by the C.E. at pages 50 & 51 are not passed. Hence the file is submitted for same.

18/12/57 18/12/57 Sd/- P.W. Secretary 18/12/57

(77) We may invite attention of CE(MH) to Govt' decision to the effect that the question was left to the decision of CE(MH).

Sec (PWD) 19/12/57 12/12/57 23/12/57

WD-0136-GPB—P. Z. S.—80,000—21-4-57.

Bhadra project. Alignment of the Right Bank channel across the Shanthisagar valley.

Mysore Government Secretariat | File No. PWD 14 BRP of 1957. | [App. F. III 2

Serial No.

(79) Ref para 76-78.

A dft letter is put up for appr

25/1 26/12/57

(80) The letter addressed by Shri.Gadgil to the Minister in reply to our letter sent to him was got today from the Minister's Establishment for further action. A draft of a reply to Shri.Gadgil is put up for consideration. Shri.Gadgil has proposed (a) to send a note to the State Government on the question and (b) to place the matter before the Committee on Plan Projects. I am afraid that if this question were still left open, we would not be contributing to quick progress on the project. The matter has taken a long time already for getting settled and any further delay would mean holding on progress on the work. I think this has to be brought home to the Planning Commission Team and if they have anything more to say on the question, they have to do it quickly so that we can take a final decision.

MINISTER FOR P.W.)

10.1.58

SECRETARY TO GOVERNMENT No. H.9.1390 10 JAN 1958 PUBLIC WORKS & ELEC. DEPTT.

OFFICE OF THE MINISTER FOR P.W. No. F 3386 10 JAN BANGALORE

Issued No MF.122 dt 10.1.58 to Sri. N.V. Gadgil

(81) 10/1

(82) 13/1/58

(83) Ref para 79 ante.

A draft letter already put up at page

Note.—Contn. Sheet

Bhadra project. Allotment of the Right Bank channel for Cropping Tr of 1957.

File No. PWD 14 BRP

Mysore Government Secretariat

Serial No.

127 c F is for approval and may be noted for issue.

15/1/58. 15/1/58 (84) Issue

16.1.58

(85)

18/1/58

*

Receipt Memo No Cop P (11) 38/469 dt 4-1-58 from the Secretary Planning Commission to Committee on flow Projects Planning Commission New Delhi.

p 157 cF.

(86) For perusal of the letter and order at page 157 cF & one set of note and a copy of letter addressed to the Chief Engr PWD by Sri Gadgil (in former portion of the letter in question) may be forwarded to the CE Nys. The D.O is submitted for approval

11/2/58. 11/2/58

11/2/58

Issued 11/2/58

Serial No.

P 185 CF.

×

Receipt letter no 8 W 11-11 (13) 57 Feb 58 from the Secretary to Govt of India Ministry of Irrn & power New Delhi

(89) For perusal of the letter at page 185 CF. The CENs who is in charge of the project may represent on the proposed Committee to be set up by the G.O.I. The CE may perhaps be consulted in the matter, for orders.

24/2/58. 24/2/58

Separate file has been opened in respect of the proposal referred to at nova (89) ante and submitted separately.

24/2

The subject matter of this ref. is different from that of his file re, alignment of the R.B.C. please open a separate file and put up.

In regards the alignment of the RBC, a report has since been received from CE(TRI) with reference to latest communication from the G.O.I. pl. put up put the matter duly

24/2

×

Receipt letter No PE 258 dt 21.2.58 from the Chief Engineer Major Irrigation Scheme Bangalore.

(90) For perusal of the letter at pages 184-185 CF w.r.t. letter at page 187 CF. It will be seen therefrom that the CENs is of the opinion that work to the extent of nearly Rs 1 lakh has already been done mainly on Excavation of the Tavarek Channel alignment behind the bund. It is also stated that it is not desirable to make any change in the decision already taken. He is

Bhadra Project - Alignment of the Right Bank Channel.

File No. PWB 14 BRP of 1957.

Mysore Government Secretariat

Serial No.

of the firm opinion that it would better to leave matters as they are and persevere with the alignment behind the bund. Perhaps the leader of the Team may be requested suitably on the lines indicated by the CE(Irrg.S). For orders.

26/2/58. 26/2/58

The letter of the Chief Engineer, Major Irrigation (South) at pages 184 to 185 C.F. may please be seen with reference to the letter of Sri N.V.Gadgil addressed to our Minister and its enclosures at pages 157 to 179 C.F. The facts of the case have been set out clearly in pages 57 to 63 C.F.

It was only a suggestion that was first made by the Planning Commission Team to take the channel over the bund by means of an R.C.C. duct, when the team met the Members of the S.T.A.C. and held informal discussions with them at the Residency on 18-5-1957. This suggestion was examined by the members of the S.T.A.C. and after obtaining their views, Government decided to leave the entire matter to the discretion of the Chief Engineer in charge of the project. The suggestions of the Planning Commission Team with regard to technical matters pertaining to the Project are purely for consideration of the State Government and their views are, therefore, not binding on the State Government. If we were bound by the decision or the views of the Planning Commission Team, Government would not have taken a final decision to leave the matter to the discretion of the Chief Engineer in charge of the Project.

Now that the Chief Engineer has taken a decision to take the channel behind the bund and has reported to Government accordingly, it implies that the matter has been decided finally. Hence, it is not wise to go back on our decision, particularly so, when it is reported that work to an extent of nearly Rs.1.00

CW

pl. put up the ref: cited at (A) in page 135 cF immediately.

1/3/58

A copy of letter dt 19/4/57 referred to at (A) at page 135 cF is at page 187 cF.

3/3/58.

Bhadra project - Alignment of the Right Bank Channel.

Mysore Government Secretariat

File No. PWD 14 BRD of 195).

[App. F. III 2

Serial No.	
	Rs.1.00 lakh has already been done, mainly on the excavation of the channel for the alignment behind the bund. We may perhaps intimate to the Government of India in continuation of our letter at page 55 C.F., and 133-CF that the matter was again looked into and that it is not possible to revise the decision already taken by Government in this connection.
	K.B. Murarappa 6/3/58 (K.B.Murarappa) Under Secretary, P.W.D.
	D/I PWD (Q.) Secy P.W.D.) D/S P.W.D. 7.3.58
	(93) A. put up at time of meeting of Bhadra Bd Committee & necessary
	D/S 8/3
	(94) Discuss the resolution of committee on the subject upon before & letter upon taken accordingly
	(95) D/S 10/3
	(A) — pl. obtain 2 copy-ghe. vade & take further action 10/3
	Typed to PWD I/C 5 12 forms in Secy I (1) The resolution of the B.R. Sht Committee at page 189 CF may be framed. A draft D. based on the report

Note.—Contn. Sheet

SECRETARY TO GOVERNMENT No. PWD 243 7 MAR 1958 PUBLIC WORKS & ELEC. DEPTT.

Serial No.

...of the CE Rly's at pages 184-187 CF is put-up for consideration ~~accepted~~

14/3/58 Secy 15/3/58

For appl.

Dy. Secy (PWD)

17.3.58

dy
Dy Secy P.W.D
18/3/58

79 243

18 MAR 1958
PUBLIC WORKS & ELEC. DEPT.

For perusal.

I have put up a separate note by about my telephonic conversation with Dr. K.L. Rao of CWPC. He is to make to visit Project early in April. I think we may wait until he comes and has a look. This letter need not go for our perusal

Min: PW

14/3

D. K. SRINIVASAN
Secy, P.W.D.

F-4238

20/3

dy
20/3

20 MAR 1958
SECRETARIAT TO GOVT.
PUBLIC WORKS & ELEC. DEPTT.

pl. place the note referred to above in this file.

KL
21/3

PWD 14 BRPS 57

SECRETARIAT GOVERNMENT
No. MG 3446
19 MAR 1958
PUBLIC WORKS & ELEC. DEPTT.

(103) The Minister desired some time ago that we ~~might~~ write to Dr.K.L.Rao, Member of the C.W.P.C. suggesting that he might visit Bhadra Project and give his views in regard to the alignment of the Right Bank Channel across Shantisagara Valley - a question which has assumed a controversial nature owing to the difference of opinion between the Planning Commission Team and the local Engineers. I contacted Dr. Rao accordingly over the telephone on the 17th and he told me that it would be possible for him to visit Mysore only towards the end of 1st week of April, and not earlier, as he had a number of other engagements in North India. The Chief Engineer, M.I.S. will be informed accordingly.

For perusal.

19/3/58

D. K. SRINIVASACHAR
Secy. P. W. & Elec. Depts.

OFFICE OF THE MINISTER FOR PUBLIC WORKS
No. F 4228
BANGALORE

MINISTER, PUBLIC WORKS)

SECRETARIAT GOVERNMENT
No.
20 MAR 1958
PUBLIC WORKS & ELEC. DEPTT.

(104) 20/3

(105) 20/3

(106) Draft letter to (MIS)

22/3

(107) A draft letter is put up
22/3/58 24/3 (104) pl. put up a typed draft as indicated

Typed draft is put up for sgnl

25/3.

Dft. may also pl. be laid before him

25/3

M9.344

SECRETARIAT TO GOVERNMENT
No .....
25 MAR 1958
PUBLIC WORKS & ELECTRICITY

Dft pld)

Secy P. W D.)

25/3

(1/2) Dr Rao's programme was received

... to me & I have myself issued letters

... Dft is also Dft Ch Bharavata.

No need for any letter now

As per instructions of
C/S, a copy of Cabinet
note read from S.of
was given to the Chairman
P.W.B re-Orgn Committee.

27/3

25/3

26/3

As for instructions in file
is put up.

11/4

pl. bring on
Monday the 14th

14/4

[illegible] /58/S.11 17th [illegible]

from the J[illegible]

Mysore Government
Secretariat

Serial No.

(11) Remarks of the Secy PW M' at page 207 cF.

xxx. The note shd be got ready by tomorrow.

Yuthd
22/4/58.

(12) The latest note received from Sri K.L Rao at pages 209-215 cF may also be perused. A draft letter ~~was~~ together with a note as instructed by U/S is put up for ~~the~~ approval

23/2/58. 23/4/58

(13) For appl.

Dy Secy PWD

23/4

(11) Dy Secy PWD
23/4/58

(11) Draft put up fair copies of above letters. To sign

24/4

(12) fair copies of the two letters are put up. for appl.

24/4/58. 24/4 Secy PWD to

D. K. SRINIVASA
Secy. P. W. & El

Dsw above 23/4/58 to Sri K.V. Gadgil

Note.—Contn. Sheet

SECRETARY TO GOVERNMENT
No. M.I.634
23 APR 1958
PUBLIC WORKS & ELEC. DEPTT.

SECRETARY TO GOVERNMENT
No.
25 APR 1958
PUBLIC WORKS & ELEC. DEPTT.

F.472
24 APR

Serial No.

Here letter to be brought
such to warrant. His address
is :—

" Director, Committee on
Plan Projects,
II Floor, Reserve Bank Buildings,
Parliament Street,
New Delhi "

19.6.64

19.6.64

CM/26/6.

For perusal of the letter and the enclosures at pages 233-237 c F.
The note of D.r K. L Rao is also at
pages 209-213 c F. As for the views of
Dr K. L. Rao vide page 213 c F 'A'
the chief Engineer in charge of the project
has now taken a decision to cross the valley by
means of an aqueduct in a straight
angle alignment approximately mid-way

WD 01774—GPB—PZS—300,000—26-10-57

Serial No.

between the bund and second site of aqueduct in a skew alignment opposite to the temple rock projection which works out to Rs 21.30 lakhs. The comparitive Statement at page 235 explains in position. ~~the remarks~~ remarks may please The matter may perhaps be placed before the S.T.A.C for ~~decision~~ information as decided at the previous meeting.

9/6/58

MCI 9/6/58

X CW/ pl. speak immediately

JL 12/6

Sr. Insp 13/6/58.

(125) of the Team

Shri. N.V.Gadgil, Leader, Committee on Plan Projects, Planning Commission, New Delhi forwarded a copy of the note prepared by the team/suggesting regarding ~~the~~ alignment of Bhova regarding Right Bank channel that the team is still of the opinion that having regard to the stability of the structure, the solution suggested by it is a most economical and feasible one. It will be recalled that Government after considering all aspects of the case left the matter to the decision of the Chief Engineer. As the decision taken by him is at variance with the Planning Commission Team's recommendation a copy of the note furnished by the team was sent to the Chief Engineer, MI (S) for his comments. Accordingly the Chief Engineer forwarded a detailed report indicating the circumstances under which the stand taken by him for the adoption of the

Bhadra Right Bank Channel behind the bund. vide pages 184-185. The matter was also considered by the former Bhadra Sub-Committee and then the committee decided that a note giving the reason for the adoption by the Chief Engineer, of the alignment behind the bund may be sent to the Irrigation and Power Team, Committee on Plan Projects for their information indicating clearly the present position. Dr. K.L.Rao, Member, Central Water and Power Commission also inspected the Bhadra Rt. Bank channel and has given a note furnishing his views in the matter.

After taking into consideration the views of the Bhadra Reservoir Special Committee and the views expressed by Dr. K.L.Rao, the leader of the Team was informed that this Government is of the opinion that the decision already taken to take the channel behind the bund may stand and the further execution of the work may go ahead in accordance with the decision already taken.

It is desirable to send a copy of letter along with the copy of the note sent to the leader of the Team, to the Chief Engineer, HI (S) so that he may be kept informed of the decision taken by Government, in the matter. This will also enable him to push through the works expeditiously. Draft also put up for consideration.

13/6/58. Mill 13/6/58

12/6) Dft. may also be put up before Secy:

16/6

Secy: may also kindly see this.

Issued 25/6

(Secy: PWD)

19/6

WD 01774—GPB—PZS—300,000—23-10-57

ON Aft
in the matter
put up w.r.t. the CE's
letter at page 233 ante

16/6

19/6

7/10/6 16/6

Serial No.

(131) Re submitted w.r.t. flora 124 ante for orders.

25/6/58

(132) pl. put up a brief typed note bringing out clearly herein, the correspondence that took place between this Govt and the G.O.I. in this matter, for the perusal of the Min^r. - Very urgent.

26/6

NOTE:-

(131) The question of ~~determining~~ fixing the alignment of Bhadra Right Bank Channel, across the Shantisagar Valley in Channagiri Taluk has been under consideration for some ~~years now, almost ever since the execution of the project, came to be accelerated under the 1st Five Year Plan.~~ time past. A number of alternatives were put up ~~even at the commencement, and after consideration~~ and they were discussed by the S.T.A.C., ~~all of them except those relating to the dropping of the Canal waters into Shantisagar and to the taking of the channel across the valley in the rear, were dropped.~~ In the meantime, the members of the Consultative Committee for Irrigation and Power constituted by the Committee on Plan Project, and the Planning Commission Team, for Bhadra Project visited the project during May 1957. The Committee and the Team ~~at~~ after Inspection met the members of the STAC on 18-5-57 and had informal discussion with the members. A suggestion was made at that time that the STAC might consider the proposal of taking the channel over the bund of Shantisagara by means of an R.C.C. Duct. This suggestion was examined by the members of the S.T.A.C. at a meeting held on 10th July 1957.

Serial No.

Since there was no unanimous opinion, the subject came up again for discussion, at the meeting held on 21st October 1957. At this meeting the opinion of the members was almost equally divided between the two alternatives, viz., taking the channel behind the bund by means of an aqueduct or a siphon, and taking it over the bund. As there was no unanimous recommendation of the committee in the matter, it was left to Govt. for a decision.

(vide paras 50-55 ante)

While the question was ~~then~~ under the consideration of Govt. in consultation with the CE in-charge of the project, the draft final report of the Planning Commission Team recommending the Duct proposals was received on 18th Nov. 1957. The State Government took into consideration the opinion of the members of the STAC and the views of the Planning Commission Team and felt that as this was a purely a technical matter, it should be left to the C.E. in-charge of the Project, for a decision, after taking into account, the views expressed by the Team and by the members of the Standing Technical Advisory Committee. The Chief Engineer in-charge of the Project reported that after taking all the circumstances into account and in the light of his personal experience and knowledge, he would consider the proposal of taking the channel behind the bund, instead of on the bund, as the one suited for adoption in the place. In coming to this conclusion, the Chief Engineer has had in view also the fact that when the Planning Commission team visited the project area, no soil test in regard to the composition of the bund had been made and that the test subsequently conducted revealed the possibility of risk in taking the channel over the Bund.

WD 01774—GPB—PZS—500,000—23-10-57

Serial No.

(17) Subsequently, the Leader of the Planning Commission Team forwarded a note prepared by the Team, regarding the alignment of Bhadra Reservoir Rt. Bank Channel stating that the Team is still of the opinion, that having regard to the stability of the structure, the solution suggested by it is the most economical and feasible one. Since the decision taken by the Chief Engineer, MI (S) was at variance with the Planning Commission Teams recommendations, a copy of the note was sent to the Chief Engineer, for his comments.

(18) The matter was again referred to the former Bhadra Reservoir Special Committee, at its meeting held on 9-3-58 for opinion. The Committee took note of the correspondence that had passed between the State Governments and the Irrigation and Power Team of the Committee on Plan Projects on the one hand, and between the State Govt. and the Chief Engineer, MI (S) on the other, and also of the latest report of the latter. The Committee considered that the decision taken by the Chief Engineer, in the matter may be allowed to stand, in the circumstances reported by him and that he may be requested to take a decision very early about adopting one of the two alternatives, for the alignment behind the bund, viz., an aqueduct and a siphon, in consultation with the STAC, if necessary. It was agreed that a note giving the reasons, for the adoption by the Chief Engineer of the alignment behind the bund may be sent to the Irrigation and Power Team on committee on Plan Projects for their information, indicating clearly the present position.

(19) The then Minister for P.W. desired that we write to Dr. K.L.Rao, Member of the Central Water and Power Commission, suggesting that he might visit

Note.—Contn. Sheet

Serial No.

Bhadra Project and give his views in regard to the alignment of the Right Bank Channel across Shantisagar Valley, a question which had assumed a controversial nature owing to the difference of opinion between the Planning Commission Team and the local Engineers.

Dr. K.L. Rao, Member of the C.W. & P.C. inspected the Bhadra Reservoir Rt. Bank Channel from the Tunnel outlet upto the weir crossing Shantisagara on 1-4-58, along with Shri. Rawhouser, T.C.M.Expert. He preferred taking the canal behind the bund to cross the Shantisagar valley and he ~~He~~ had mentioned three alternatives regarding the method of crossing the valley, ~~and~~ He has stated that the choice might be left to the Chief Engineer in-charge of the Project.

Accordingly the Leader of the Team was intimated on 25-4-58 ~~stating~~ that this Govt. is of the opinion, that the decision already taken to take the channel behind the bund, may stand and further execution of work may go ahead in accordance with the decision already taken. The alternatives suggested by Dr.K.L. Rao are however kept in view and whichever is found to be the most feasible in the judgement of the Chief Engineer, in-charge will be adopted.

The Chief Engineer, Major Irrigation (South) has now stated that the three proposals for crossing the valley suggested in the Inspection Notes of Dr. K.L.Rao, have been surveyed and estimated and it is found that the third proposal of an aqueduct in a right angle alignment approximately midway between the bund and second side of aqueduct in a skew alignment apposite to the temple rock projection, works out to Rs. 21.30 lakhs and is the cheapest as per comparative statement enclosed. An alternative design of a Bow-string

Serial No.

Girder for the aqueduct is being worked out to further reduce the cost if possible, and he is going ahead with the sanction of the estimate for the aqueduct as mentioned in the penultimate para of Dr. K.L.Rao's Inspection Note.

Since the former Bhadra Reservoir Special Committee decided to take a decision in consultation with the S.T.A.C. at the meeting held on19-3 1958 referred to above, this may perhaps be referred to the STAC for ~~opinion~~ information. (Refer para 137)

This does not seem to be necessary, and the decision re: alternatives of taking the channel behind the bund by aqueduct or syphon, was left to CE (MIS) and he might take the decision in consultation with S.T.A.C. if necessary. Dr. K.L. Rao has also suggested that the choice might be left to the EE in charge of the project

KL 5/6

For Perusal. KL 3/6

D/I PWD Sec PWD 30/6/58 Mel 30/6/58

SPWD 7/7

This may be brought to notice of Bhadra Project Board at its meeting to-morrow

7/7

SECRETARY TO GOVERNMENT NO ..... 7 JUL 1958 PUBLIC WORKS & ELEC. DEPTT.

SECRETARY TO GOVERNMENT MI 1231 15 JUL 1958 PUBLIC WORKS & ELEC. DEPTT.

A note on the alignment of the Right Bank Channel of the Bhadra Project across Shantisagara valley was placed before the Bhadra Project Board at its meeting held on 8th July 1958 for information of its members.

Sri M.Narasimhaiya desired that abstract estimates of the three alternatives for taking the channel to cross the Shantisagara valley as suggested by Dr. K.L. Rao, might be called for from the Chief Engineer, Major Irrigation (South) and put up before the next meeting of the Board for their information. The Chief Engineer, Major Irrigation (South) will be addressed to forward the same at an early date.

D/I PWD Sec PWD

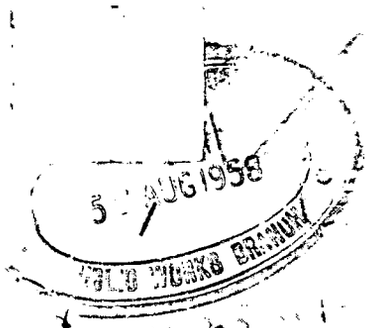
For Perusal before taking further action. KL 10/7

SPWD 10/7

Note.—Contn. Sheet

Minute of the Chief Minister

CM 941 Ew 1
5/8/58



The Secretary to Government, Public Works Department may please see the letter dated 2nd August 1958 (enclosed) received from Shri N.V.Gadgil and send a draft of a reply to be sent to Shri N.V.Gadgil very early through the Minister for Public Works and Electricity.

(D. D. JATTI.)
CHIEF MINISTER.

Secy., to Govt.,
P.W.& Elec.Deptts.,

smk

(152) Pl speak
ujs (M.S). dy 5/8

Today
Sri HH pl. bring up with the connected file
SL 6/8

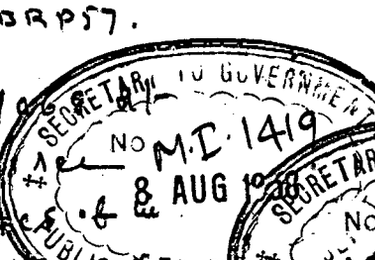
Discussed - Put up after I talk to him personally tomorrow
dy 8/8

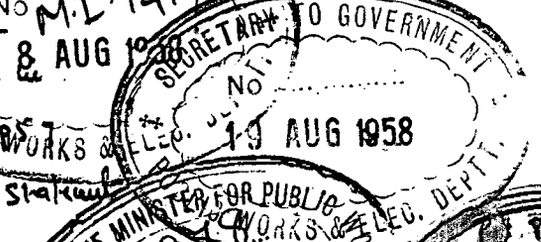
(154) A draft is put up for consideration.
SL 8/8

1) Letter No MPW 80 dt 25/4/58 at page 227 CF of this file No PWD 14 BRP 57.

2) B.O letter No 10 dt 5-12-57 - put up at page No 114 CF of file No PWD 68 BRP 57 Circle letter and statement at page 100 CF.

VS 3225/58-59
18.8.58





Min: PW & Chief Min:

D. K. SIVASAC
Secy. P. W. & Elec. Depts.

(155)
Hell 18/8

Chief Minister
2898/58-59
19 AUG 1958

Secy P.W.D

Division from
Chief Minister
18/8.

SL 19/8
dy 19/8

For perusal of the letter at page 259. The Comparitive Statement showing difference & abstract Copy of the estimate for the three alternatives as suggested by Sri K.L. Rao, previously furnished by the CE/TGS is found at page 235 c F. The file may perhaps may be referred to the Secy S.T.A.C for further action.

Committee Section
Bring up
Arranged
P. 260

20/8/58

20/8/58

Receipt letter no 44490-91 dt 2-9-58 from the S E, BR. Tunnel circle.

The SE has reported that the requisite abstract estimate of the three alternatives for taking the Channel to cross Bhavanisagar valley; as suggested by him have been forwarded to CE in fifteen copies on 2nd. Sept: 1958.

The file is returned to M.I. Section.

22/9

24/2/59

Appendix F. G.—1]

SUBJECT Alignment of the Bhadra Reservoir Right Bank Channel beyond Hirenalali Tunnel for Crossing Shanti Sagar Valley.

Diary No. of letter replied to .....

Mysore Government Secretariat.

( )

the *195* .

No. RWD 14 BRP 57

To 16.2.57

The Chief Engr. (E) M.I. (S) Bangalore

Date of issue.....

Sir,

Signed by.....

I am desired to enquire whether the details with reference to several items required by S.T.A.C. on the above Subject called for in this Office letter No. 14 BRP 57 dated 7.2.57, are and when they may be expected here, so that necessary arrangements for Convening the next S.T.A.C. meeting may be made early.

List of enclosures .....

Copied by.....

Examined by .....

Yours faithfully,

Secretary

S.T.A.C.

16/2

14

K.B.Murarappa, B.E.,
Asst.Secretary to Govt.,
Public Works Department.

Mysore Government Secretariat,
Vidhanasoudha,
Bangalore, dated 25 Feb.1957.

D.O.No. PWD 14 BRPS-7

Dear Sir,

Sub: Alignment of the Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel for crossing Shanti Sagar Valley.

Ref: 1. This office No.PWD 14 BRP 57 dated 7-2-1957.
2. PWD 14 BRP dated 16-2-1957.

I am desired to enquire whether the details with regard to several items required by the Standing Technical Advisory Committee on the above subject as called for in this office letter cited first are ready and if so, the same may kindly be furnished urgently to the Secretary of the Committee so that necessary action may be taken for arranging the Inspection or the meeting of the members of the S.T.A.C. The matter may kindly be treated on the top-most-priority basis and reply sent by return of post.

Yours sincerely,

To

Sri T.Ramaswamy Iyengar, B.A.,B.E.,
Chief Engineer, Major Irrigation (S),
B a n g a l o r e.

PWD 14 BRP 57

M. G. S. App. F. G. 3]

MYSORE GOVERNMENT

SECRETARIAT.

(*Continuation sheet draft form*).

D.O.NO. PWD 14 BRP 57
dt - 25-2-57

Sub:- Alignment of the Bhadra Reservoir Right Bank Channel beyond Hirenelali Tunnel for crossing Shanbhagar Valley.

Dear Sir,

Ref:- (1) T.O.No. PWD 14 BRP 57 dt. 7-2-57.

(2) PWD 14 BRP 16-2-57

I am desired to enquire whether the details with regard to reveral items required by the S.T.A.C in the above subject as called for in the above letter cited first are ready and if so, the same may kindly be furnished to the Secy. of the urgently Committee, at the earliest, that necessary decision may be taken for arranging the Inspection

WD 0258—GPB—PZS-1,20,000—1-7-55.

1.

or the meeting of the members of the S.T.A.C. The matter may kindly be treated as of top priority & brain and reply sent by return of post. Yrs S.

23/4/57

7.

C.S.T.O.(S) (By name)

Bajpai.

23/4/57 23/4/57

Appendix F. G.—1]

SUBJECT Alignment of Bhadra Reservoir Right Bank Channel beyond Hirenahalli Tunnel-for Crossing Shanthasagar Valley

(2) 11/3/57

Diary No. of letter replied to .....

Mysore Government Secretariat.

( )

the 195 .

Section

File No.

Serial No

No. PWD 14 BRP 57 29/2-3-57

To

The C.E. M.I.(S)
Bangalore

Sir,

Sub:- as above

Ref:- This Office letter Secret
Lr. No. PWD 14 BRP 57
dated 25.2.57

Please refer to the letter of this office on the Subject mentioned by the STA-C above. As the inspection of the Contours of Shanthasagar by the STA-C, has to be arranged during this month I am to request you kindly to forward the notes containing all the information which the Members of the Committee desired during their discussion

4

for being furnished to them before their inspection of the Spot ~~and the meeting to be convened~~ of the Site

~~immediately thereafter~~

This may be dealt with on top-priority basis & notes forwarded immediately to me

Secretary
S.T.A.C

11/3

11/3/57

9

GOVERNMENT OF MYSORE.

No.PWD14BRP57.

Mysore Government Secretariat,
Vidhana Soudha,
Bangalore, Dated, the 11th March 1957.
12

From

The Secretary,
Standing Technical Advisory Committee,
Bangalore.

To

The Chief Engineer,
Major Irrigation (South),
Bangalore.

Sir,

Subject:- Alignment of Bhadra/Right Bank Channel beyond Hiremalali Tunnel for crossing Reservoir Shanti Sagar Valley.

Reference:- This office letter resting with No. P.W.D.14BRS57 dated 25-2-1957.

***

Please refer to the letter of this office on the subject mentioned above. As the inspection by the Standing Technical Advisory Committee of the contours of Shantisagar has to be arranged during this month, I am to request you kindly to forward notes containing all the information which the members of the Committee desired during their discussion for being furnished to them before their inspection of the spot.

This may be dealt with on top-priority basis and notes forwarded forthwith.

Yours faithfully,

(H.Channiah) 12/3/57
SECRETARY,
Standing Technical Advisory Committee

Bvh.2.

PWD 14 B 3/57

Memo No. 5002-3 date 11/3/57

Copy of the foregoing along with one set of particul
forwarded to the Secretary to Government, Public Works
Department, Bangalore, for information, as desired.

11/3.

Deputy Chief Engineer,
Major Irrigation -South.

bvb

MYSORE GOVERNMENT SECRETARIAT
NO. M.I.S.....
13 MAR 1957
PUBLIC WORKS BRANCH

SECRETARY TO GOVERNMENT
Date 14-3-57
PUBLIC WORKS & ELEC. DEPTS.

MYSORE GOVERNMENT SECRETARIAT
NO. 915.....
14 MAR 1957
PUBLIC WORKS MAJOR IRRIGATION BRANCH

C. F. No. 46]

GOVERNMENT OF MYSORE

No.
Encls.

OFFICE Office of the Deputy Chief Engineer,
Major Irrigation - South,
BANGALORE.

Date

To

The Secretary,
Standing Technical Advisory Committee,
BANGALORE.

Sir,

Sub:- Alignment of Bhadra Reservoir Right Bank channel beyond Hiremallali tunnel for crossing Shantisagar village.

-:o:-

With reference to letter No.P.W.D.14-SRS.57 dated 7-2-1957 received from the Secretary to Government, Public Works Department, requesting to furnish the particulars referred to in the proceedings of the meeting of Standing Technical Advisory Committee held on the 20th December, 1956, I write to forward the same in eleven sets, for further needful.

Yours faithfully,

sd/-
(G.Krishnaswamy)
Deputy Chief Engineer,
Major Irrigation- South.

bvb

Preliminary meeting of the Standing Technical Advisory Committee held in the Office of the Chief Engineer, Major Irrigation (South), Bangalore, on the 2nd April 1957 at 8-30 A.M.

Members present:

Sri T.Ramaswamy Iyengar, B.A., B.E.,
Chief Engineer, Major Irrigation (South)
(Chairman)

Sri M.G.Rangaiya, B.A., B.E.,
Chief Engineer of Mysore (Retd)

Sri M.Narasimhaiya, B.A., C.E., M.I.E.,
Chief Engineer of Mysore (Retd)

Sri B.S.Narasinga Rao, B.A., B.E.,
Chief Engineer of Mysore (Retd)

Sri M.N.Lakshmana Rao, B.A., B.E.,
Chief Engineer of Mysore (Retd)

Sri K.S.Gangadhara, B.E., M.I.E.,
Chief Engineer of Mysore (Retd)

Sri H.Ananthachar, B.E., A.M.I.E.,
Chief Engineer of Mysore (General)

Sri H.Channiah, B.E.,
Under Secretary to Government, P.W.D.
(Secretary)

3 alternative alignments in brief.

Proposal I: Taking the Davangere Branch channel around waterspread of the Shantisagar.

Proposal II: Taking the alignment on the ~~right~~ side of Shantisagar and crossing the valley below ~~take by~~ tank by means of syphon aqueduct.

Proposal III: Dropping the channel into the Shantisagar tank and drawing off the branch channel from there.

Alignment of Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel for crossing Shantisagara Valley.

R E S O L U T I O N.

All the three alternatives have been considered and the majority of the Members, who inspected the area, are in favour of either I and II preferably No.II. But before a final decision could be taken the Chief Engineer is requested to give a comparative correct costs of all the 3 alternatives.

But, All have agreed in respect of the alignment A. C. D. from the exit (Point A) of the tunnel vide Index Plan. The Committee recommend that the work in this Section A. C. D. can be proceeded with.

It was brought to the notice of the Committee by Members who inspected the alignment recently that the

P.T.O.,

people of the locality both above the catchment and below the tank, are against the proposal of dropping the water into the Reservoir and taking it off.

Sri H.Ananthachar, Chief Engineer (General) has inspected the area separately and agrees with the above resolution.

Sri N.Neelakantappa, who inspected the area was not present at this meeting.

(H.Channiah)
Secretary,
Standing Technical Advisory Committee.

TSRN.

A further note on several alternative alignments of Bhadra Channels beyond the Hiremalali Tunnel on the Right Bank channel of Bhadra Reservoir Dam.

As originally proposed, estimates were got up for three alternative alignments of the branch channels beyond the tunnel near Hiremalali. The estimates were submitted for approval to take up one of the alternatives in the month of September 1956. The papers had been circulated among all the members of the Standing Technical Advisory Committee with a note from the Chief Engineer.

The Committee discussed the subject on 5.12.1956 at Bangalore and it was proposed to keep the subject for spot inspection. The Committee desired that the Executive Engineer might further investigate the following alternatives regarding Davanagere Branch on the left bank hill of Shantisagar Tank bund.

(a) Davanagere Branch to cross the Hill Range by means of a tunnel instead of running on the steep slope of the hill at the left bank of Shantisagar Tank bund.

(b) Taking the branch channels through the road saddle on the left bank of Shantisagar tank and approaching the valley in contour behind the hillock and beyond the tank bund by about a furlong.

(c) To drop the main channel at R2 beyond the road saddle into Thottinavadaku and picking up the water by a masonry dam with sluices provided for both the branch channels.

The above alternatives have also been investigated and the position of syphon or aqueduct crossing Shantisagar valley is shifted by about a furlong from the rear toe of the tank bund. The members of the Committee inspected the alignments on 22.12.1956. They met on 23.12.56 at Shimoga to discuss the proposals. It was desired that the following alternatives might be further investigated.

i) To take Davanagere Branch channel behind Appanavaddu and Hallur tank rounding the Hallur village on the lower side with an aqueduct for the valley.

ii) To investigate alternatives for Malebennur branch channel beyond R2 i.e. after crossing the road saddle and on the following lines.

(a) One alignment to go along left hill slope in contour.

(b) The other to go in the contour on the right hill slope crossing Thottinavadaku valley with an aqueduct.

These alternatives have been investigated and estimates are got up.

The Standing Technical Advisory Committee met on 29.12.56 at Bangalore and discussed the subject in detail. It was then desired that the estimates might be recast by providing suitable rates for excavation of the channel as per actual soil classification and put up before the committee.

Trial pits were dug all along the channel alignments and at places where important masonry works are proposed to correctly evaluate the cost of excavation and masonry works.

The Chief Engineer, Major Irrigation, South inspected the spot on 3.1.57 with the Superintending Engineer, Tungabhadra Valley Circle and gave further instructions to slightly shift the alignment of Davanagere Branch channel via: Devarahalli in main valleys to reduce the depth of banks. He also proposed

He also proposed shifting of such of the villages lying below the channel alignments. He also gave instructions to provide deeper foundations for abutment, and wings of syphon cum-r passages.

Further investigations have been completed as per instructions and a Jeep path has been formed all among the alignment to facilitate detailed inspection.

Originally Davanagere Branch Channel via: Devarahalli was taken in deeper cutting in places where the villages were close by. Since it is now proposed to shift some of the villages lying below the channel, these deep cuttings are now avoided and the channel is taken in contour.

Estimates are set up for the channels wherever alternative alignments are feasible and a final selection has been made amongst them considering the several advantageous and disadvantageous.

Estimate No.1:- The first estimate is for cost of excavation of Main channel from Regulator D to point K dropping the water into the tank and to take off Davanagere Branch channel via: Channapur saddle upto common point H. The Davanagere Branch Channel is proposed to be drawn at R.L. 1968.00. The total cost of this estimate comes to Rs. 40,30,000/-

Estimate No.2:- This estimate provides for taking Davanagere Branch channel from Regulator D in contour, rounding the Kallur village and Devarahalli village on the lower side and crossing the major hollas with syphon cum-r passages. The cost of this estimate comes to Rs. 1,35,00,000/-

Estimate No.3:- This estimate is for continuing the main channel from point D to regulator point R2 where the two channels will be taken on either sides of the valley. This estimate includes the cost of Davanagere Branch from R2 to the common point H by crossing Chantisagar valley with an Aqueduct, situated one furlong behind the bund. The cost of this estimate comes to Rs. 1,27,00,000/-

Estimate No.4:- This estimate is for running Halebennur Branch channel from Regulator D to point R2 which forms the common point on the left bank of Chantisagar for comparision of several alternatives. The cost of this estimate comes to Rs. 30,50,000/-

Estimate No.5:- This is the estimate for taking of Halebennur Branch channel from the tank at R.L. 1972.00 at X and crossing the road saddle via: R1 and R2. The cost of this portion of work comes to Rs. 15,60,000/-

Estimate No.6:- This estimate amounting to Rs. 29,70,000/- is for continuing the draft channel ~~xxxxxxx~~ from point "A" beyond the tunnel end upto the point D behind Kallur Chikkere from Kapona vaddu). This is a common length of channel for all the alternatives under consideration. For any alternative alignment, the draft channel along ACD is preferred to AB which was originally proposed.

A comparative statement of cost of each alignment is enclosed. Since the length ACD is common, the cost of that portion is not included in the statement. As could be seen from the comparative statement, the total estimated cost of proposal No.1 i.e. taking Davanagere Branch to H. via: Devarahalli and Halebennur Branch channel from D to R2 is Rs. 1,63,50,000/- In proposal II the estimated cost of the main channel upto R2 and Davanagere Branch Channel upto H from R2 comes to Rs. 1,27,00,000/- . The third proposal i.e. to drop the water into the tank and drawing Davanagere Branch

...Page 3 ../

Davanagere Branch channel at R.D. 1960.00 and excavating the channel up to point "H" and also to draw Halebommur channel at R.D. 1972.00 and taking the channel upto H2 which is the common point on the left bank comes to Rs. 55,90,000/-

In all these estimates, rates for excavation have been provided as per classifications met with in the trial pits, which are opened out all along the channel alignments at about two furlongs apart. Necessary provisions for the masonry works have been made. For acquisition of lands, the latest rates of transactions in the Sub Registrar's Office at Chennagiri are taken for consideration. The provision for shifting of villages is made as per detailed estimates worked out for a few buildings in each type and an average rate is adopted for evaluation.

This report may kindly be read with the original report placed before the Committee.

--oOo--

A.B. Ramamurthy 14/2/57

Executive Engineer, No.9 Survey and Designs Div. Thyavvinige.

R.V. Raju 15-2-57

Superintending Engineer, Tunga Bhadra Valley Circle, T.B. Project.

Chief Engineer, Major Irrigation-South Bangalore.

KRI.
14/2/57.

Annexure No. 4.

Comparative cost of the three alternative alignments beyond Hemavathi Channel on the Right Bank Channel of Hadra Reservoir.

Sl. No.	Particulars.	Proposal III. Cross the main channel into Nesargi and two off take channels cross the saddle on the flanks of hill.	Proposal I. Contour channels - Lavanagere Branch on the Right - Holebennur Branch on the left above water spread of Bank.	Proposal II. Continue main channel upto 32 and Lavanagere Branch to cross Chanti-gerer valley behind the Bank.	Remarks.
I.	Dropping proposal including Lavanagere Branch Channel upto 4 - Estimate No.1 enclosed.	40,30,000/-	—	—	
II.	Holebennur Branch Channel from water spread to 32 at R.D. 1072.00 (4 to 32) Estimate No.5 enclosed.	15,00,000/-	—	—	
III.	Taking Lavanagere Branch Channel on the Right side above water spread via Davangere upto 4 - Estimate No.2 enclosed.	—	1,33,00,000/-	—	
IV.	Cost of Holebennur channel on the left side in contour upto 32 (4 to 32) Exhibit No.4	—	30,50,000/-	—	
V.	Main channel from 4 to 32 and Lavanagere Branch channel from 32 to 4 below the Bank bund - Estimate No.3 enclosed.	—	—	1,27,00,000/-	
	TOTAL COST.	55,30,000/-	1,63,50,000/-	1,27,00,000/-	

A.B. Ramaiengowd
Executive Engineer,
Survey and Design Division,
Harihar.

R.L. Rao 15-2-57
Superintending Engineer
Tungabhadra Valley Circle,
Hospet Project.

Chief Engineer,
for Irrigation (South)
Bangalore.

13/2/57.

PROPOSAL NO.III. ESTIMATE NO.1.

Abstract of estimate for dropping channel into the tank and taking off new escape Branch channel at R.L. 1968.00 (Draw off of Malebennur channel is not included in this estimate.

I. Earthwork excavation:			
i) DK. contour.	73,565 @ 6/-		4,41,390/-
ii) KH.	26,269 @ 6/-		1,57,614/-
Scale upto 45' depth	53,495 @ 12/-		6,41,940/-
-do- Above -do-	92,045 @ 14/-		12,88,630/-
iii) Maintenance during execution.	3¼ miles @ 600		1,950/-
iv) Miscellaneous and rounding.			476/-
		Rs.	25,32,000/-
II. Embankment.	—NIL—		- - -
III. Masonry works: DK. Superpassage	1,63,500		
Road bridge	28,500		
-do-	28,500		
Rapids	2,00,000		
	4,20,500		
LB: Regulator & RB	100,000		
Deviation of Kesalu-Malekere Rd. of about 2 miles.	50,000		
	5,70,500		5,70,500/-
IV. Miscellaneous works:			
(a) Grading of canals	3¼ miles @ 900/-		2,925/-
(b) Storm drainage & silt trap	-do- @ 3300/-		10,725/-
(c) Service roads	-do- @ 3600/-		11,700/-
(d) Planting avenue trees	-do- @ 500/-		1,625/-
(e) Final surveys before execution.			325/-
(f) Soil & malarial surveys.			2,500/-
(g) Water supply & sanitation.	L.S.		10,000/-
(h) Colonization of Agri: labour.			2,500/-
(i) Building.			10,000/-
(j) Rounding.			200/-
			52,500/-
V. Protection to slopes in soft soils 48 grades @ 2500.			120,000/-
	Total of items I to V.	Rs.	32,75,000/-
I. Acquisition of lands:-			
(a) Compensation for lands 135 acres.			
Dry 105 acres @ 250/- = 26,250			
Wet 21 " @ 800/- = 16,800			
Kharab 9 " @ 1000/- = 9,000			52,050/-
(b) Abatment of land revenue @ 20/- per acre	1 Ac.		2,700/-
(c) Statutory allowances @ 15%			7,808/-
(d) Miscellaneous acquisition charges	L.S.		500/-
(e) Establishment @ 5%			2,603/-
(f) Miscellaneous and rounding.			39/-
			65,700/-
I. Contingencies @ 5% on Rs 32,68,200/-			1,63,750/-
VIII. Petty supervision charges @ 1%			32,750/-
IX. General establishment charges @ 7½%			2,45,625/-
X. Strengthening Chantisagar & increasing w.w.length			2,00,000/-
XI. Miscellaneous and unforeseen charges.			14,425/-
XII TOOLS AND PLANT AT 1%	32,750		
This estimate does not include cost of taking off Malebennur channel.		Total Rs.	40,30,000/-

T.B. Ramanand 15/2

Executive Engineer, Survey & Designs Divn. Bhyavanige.

R L Rao 15.2.57

Superintending Engineer, Tungabhadra Valley Circle, B.R. Project.

Chief Engineer. Major Irrigation-South, Bangalore.

CKI.
15/2/57.

Detailed estimate for ~~proposal No.2~~ contour channel from D to H via: Devarahalli.

I. Earthwork excavation in all soils:-

		Contour.	Saddle.		
DE.	1-5-3	52,077			
EI.	2-2-4	1,01,547	10,900		
IJ.	1-3-1	44,392			
JU.	2-2-3	89,500			
UV.	2-2-4	78,001			
VW.	3-2-4	1,25,627			
WY.	1-3-1	45,629			
YZ.	3-4-3	1,44,932			
ZZ1.	0-5-5	54,500	77,265		
	19-5-0	7,37,005	88,165		
		Contour	7,37,005	@ 6/-	44,22,030/-
		Saddle	88,165	@ 12/-	10,57,980/-
					54,80,010/-
(b) Maintenance during execution 20 miles @ 600/-					12,000/-
(c) Miscellaneous and rounding.					7,990/-
					55,00,000/-

II. Embankment:

DE.	As per estimate.	22,000/-
IJ.	8504 Chennagiri Kalla.	85,040/-
JU.	1500	15,000/-
VW.	As per detailed estimates (2,45,000 + 75,000)	3,20,000/-
	Rs.	4,42,040/-

III. Masonry works:-

1)	Superpassage for Kallur Chikkere N.H.	1,15,850/-
2)	Road bridge for J.N. Road 0-3-550	23,000/-
3)	-do- Chennagiri Davanagere Road 0-7-110	23,000/-
4)	Aquoduct with masonry walls 1-2-440	6,40,000/-
5)	Cart bridge 1-6-330	13,500/-
6)	Relieving weirs 2-1-330	19,150/-
7)	Cart bridge 2 Nos. @ 2-2-330 @ @ 9-3-0	27,000/-
8)	Kallahalli super passage.	1,63,350/-
9)	Cart bridge near Mantraghatta 2 Nos. @ 13,500/-	27,000/-
10)	-do- 4-3-220	13,500/-
11)	Syphon super passage @ 4-4-0 Rft. 256 x 50	3,25,600/-
12)	Cart bridge 5-5-110	15,500/-
13)	Relieving weirs 6-4-550	23,050/-
14)	Cart bridge 2 Nos. 6-7-550 & 7-4-330	27,000/-
15)	Syphon super passage 7-5-0 Rft. 76 x 50	2,40,100/-
16)	Cart bridge 8-2-220	13,500/-
17)	Relieving weir 8-5-550	39,800/-
18)	Cart bridge 9-0-440	13,500/-
19)	Relieving weir 9-4-220	14,000/-
20)	Cart bridge 9-4-220	13,500/-
21)	Relieving weir with sluice 10-0-440	25,800/-
22)	-do- 10-2-440	9,950/-
23)	Covered duct between 10-4-0 & 11-0-0	7,08,600/-
24)	Cart bridge 11-0-550	13,500/-
25)	Relieving weir 10-1-330	19,900/-
26)	Road bridge 11-3-0	23,000/-
27)	Syphon superpassage for Lumbrahalla 11-4-0	4,07,770/-
28)	Cart bridge 12-4-0	13,500/-
29)	Syphon superpassage for Hirehalla 14-5-0	6,40,200/-
30)	Protective works for hallahed.	61,900/-
31)	Relieving weir. 14-3-330	23,000/-
32)	Road bridge 14-5-330	12,525/-
33)	Relieving weir 15-0-440	18,425/-
34)	-do- 15-7-0	13,500/-
35)	Cart bridge 16-4-220	13,500/-
36)	-do- 17-0-440	33,350/-
37)	Relieving weir 17-2-440	

(contd.)

Masonry works contd..

38)	Cart bridge	17-5-440	13,500/-
39)	-do-	18-1-330	13,500/-
40)	Relieving weir	18-2-550	11,050/-
41)	Road bridge	19-3-440	23,000/-
		Extra.	11,000/-
42)	Relieving weir	19-4-330	18,150/-
43)	Cart bridge near Hatti & Chan_ur 2 Nos.		27,000/-
		Rs.	39,46,410/-

IV. Miscellaneous works:-

(a)	Grading of canals @ 900/- per mile for 20 Mls.	18,000/-
(b)	Berm drainage & silt trap @ 3300/- per mile.	66,000/-
(c)	Service road @ 3600/-	72,000/-
(d)	Planting avenue trees @ 500/-	10,000/-
(e)	Final surveys before starting @ 2000/-	2,000/-
(f)	Soil and aerial surveys.	2,000/-
(g)	Water supply & sanitation.	1,00,000/-
(h)	Colonisation of Agri: labour.	50,000/-
(i)	Building for one sub division.	20,000/-
(j)	Shifting of villages Kireuda, Somagondanahalli, Himbapura, Mantraghatta and Chikkuda.	4,03,740/-
(k)	Formation of sites and approach roads	50,000/-
(l)	Miscellaneous and rounding.	6,260/-
		8,00,000/-

V. Protection to slopes of channel in soft soil in 5 miles @ 2500/- per grade. 6,00,000/-

Total I to V .. 1,12,88,440/-

Acquisition of lands:-

(a) Compensation for lands 40 x 20 = 800 acres.

Dry	720 acres	@ 250/-	1,80,000/-
"	50 "	@ 800/-	40,000/-
Wet	21 "	@ 800/-	16,800/-
Garden	9 "	@ 1000/-	9,000/-
			2,45,800/-

(b)	Abatement of land revenue @ 20%	16,000/-
(c)	Statutory Allowance @ 15%	36,870/-
(d)	Miscellaneous acquisition charges @ 5%	5,000/-
(e)	Establishment charges @ 5%	12,300/-
(f)	Miscellaneous & rounding	30/-
	Rs.	3,16,000/-

VII.	Contingencies @ 5%	5,64,400/-
VIII.	Petty supervision charges	1,12,900/-
IX.	Tools and Plant @ 1%	1,12,900/-
X.	General establishment @ 7½%	8,46,600/-
XI.	Miscellaneous and unforeseen items	58,750/-
	Total Rs.	1,33,00,000/-

A B Ramamurthy (14/2/57)
Executive Engineer,
C.D. Survey and Designs Dn.
Thyavanige.

K Lakshmaiah (14/2/57)
Superintending Engineer,
Tungabhadra Valley Circle,
& Project.

Chief Engineer,
Major Irrn. Wks.
Bangalore.

GHI.
14/2/57.

[redacted]AL : 0.II. SCHEDULE NO.3.

Estimate for continuing main channel from D to D2 and Davanagere Branch channel from D2 to H behind the tank.

DR1 6-0-550
R1D2 0-3-110
D2PC 1-7-550
CHH. 8-2-440
16-6-330

Earthwork excavation for				
DR1	contour 2 x 176585=35,3170 units @ 7/8/-			26,48,775/-
R1D2	" 12,939 @ 7/8/- = 97,043)			4,38,599/-
	saddle 28,463 @ 12/- =341,556)			
D2PC	Contour 1,01950 units @ 7/8/-			7,54,625/-
CHH. 8-0-330	" 2,78851 " -do- 20,91,383)			27,07,763/-
8-2-110	saddle. 51365 " @ 12/- 6,16,380)			
8-2-440				
(b) Inter-lace during execution 16-13/16 miles @ 600/-				10,088/-
(c) Miscellaneous and rounding.				150/-
				65,60,000/-
II. Embankment: DR1 = 1000) CHH = 19091)	20091 units @ 10/-		..	2,00,910/-
III. Masonry work :-				
DR1 -				
	underpassage at 0-5-220	2,09,600		
	-do- 1-3-0	2,40,000		
	Road bridge.	28,500		
	Cart "	18,500	6,61,155	
	-do-	18,500		
	-do-	18,500		
	-do-	18,500		
	Relieving weirs & inlets.	1,11,055		
D2PC	Cart bridge.	13,500	31,100	
	Relieving weir.	17,600		
CH:	Aqueduct across for Ulsoor valley.	19,30,000		
	Road bridge	23,000		
	Deviation Road	5,000		
	Aqueduct across N.H.valley	4,55,000		
HH:	Cart bridge.	13,500		
	Road bridge.	23,000	25,30,515	
	Relieving weir & inlet.	8,550		
	-do-	19,310		
	Cart bridges No.s3	40,500		
	Relieving weir & inlet	19,155		
	Cart bridge.	13,500		32,23,355/-
IV. Miscellaneous works:				
(a) Fencing of canals 16-13/16 miles @ 900/-				15,130/-
(b) Land drainage & silt trap @ 3300/-				55,480/-
(c) Service roads @ 3600/-				60,525/-
(d) Planting avenue trees.				8,410/-
(e) Final survey before starting.				1,700/-
(f) Soil and drill surveys.				2,500/-
(g) Water supply & sanitation.				1,00,000/-
(h) Colonization of agricultural labour.				10,000/-
(i) Building for one sub division.				20,000/-
(j) Shifting of villages (Sannetthalli & Kranganaghatta)				1,26,000/-
(k) Location of colony sites and approach roads.				20,000/-
(l) Contingencies.				255/-
			Rs	4,20,000/-
V. Protective works to slopes in soft soils: 4 miles 40 x 4 = 102 grades @ 2500/-				4,80,000/-

(Contd.)

Earthwork excavation:		
a) Saddle.	1,47,351 units @ 14/-	20,62,914/-
b) Contour.	21,766 " @ 7/8/-	1,63,245/-
c) Maintenance during execution	1½ miles @ 600/-	900/-
d) Miscellaneous and rounding.		2,941/-
		22,30,000/-
II. Embankment.	--NIL--	---
II. Masonry works:- i) Superpassage	2,30,000/-	2,30,000/-
IV. Miscellaneous works:-		
(a) Grading of canals @ 900/- per mile.		1,350/-
(b) Berm Drainage & silt trap @ 3300/- per mile.		4,950/-
(c) Service road @ 3600/- per mile.		5,400/-
(d) Planting avenue trees @ 500/- per mile.		750/-
(e) Final surveys before starting.		300/-
(f) Soil and malarial surveys.		1,000/-
(g) Water supply and sanitation.		5,000/-
(h) Colonisation of agricultural labour.		2,000/-
(i) Buildings.		10,000/-
(j) Miscellaneous and rounding.		250/-
	Rs.	31,000/-
V. Protection to slopes: 26 grades @ 2500/-		65,000/-
Total for item I to V Rs.		25,56,000/-
VI. Acquisition charges:-		
(a) Compensation for lands: 5 acres Garden @ 800/-= 4000		
57 acres Dry @ 250/-=14250		
	28250	28,250/-
(b) Abatment of land revenue @ Rs 20/- per acre for 62 ac.		1,240/-
(c) Statutory allowances @ 15%		4,240/-
(d) Miscellaneous acquisition charges. L.S.		1,000/-
(e) Establishment charges @ 5%.		1,410/-
(f) Miscellaneous and rounding.		860/-
	Rs.	37,000/-
VII. Contingencies @ 5%.		1,27,800/-
VIII. Petty supervision @ 1%		25,560/-
IX. Tools and Plant @ 1%		25,560/-
X. General establishment @ 7½%		1,91,700/-
XI. Miscellaneous and rounding.		16,380/-
Total Rs.		29,70,000/-

A.B. Ramamurthy 18/2/57

Executive Engineer,
O.9 Survey & Designs Dn.
Thyavanige.

R.L. Rao 15.2.57

Superintending Engineer,
Tungabhadra Valley Circle,
B.R. Project.

Chief Engineer
Major Irrigation
Bangalor

K.
4/2/57.

Alt No.III. ESTIMATE No.5.

ate for excavating Malebennur branch channel from the waterspread of ore Tank at R.L. 1972.00 upto R2 - Length 40 grades. XR1R2.

I.	Earthwork excavation:			
	a) Contour channel	6867 units @ 7/8/-		51,503/-
	b) Middle upto 45' depth.	19831 " @ 12/-		2,37,972/-
	c) -do- above 45'	60446 " @ 14/-		8,46,244/-
	d) Maintenance during execution @ 600 /mile.			500/-
	e) Miscellaneous and rounding.			3,781/-
			Rs	11,40,000/-
II.	Embankment.	-- Nil--		- - -
III.	Masonry works:			
	a) Road Bridge for Channagiri- Davangere Road	18,000		
	b) Sluice for Regulator & deviation road.	1,00,000		
	c) Overflowing weir 130 Rft @ 75/-	10,300		1,31,660/-
	d) Intake 48 Rft @ 70/-	3,360		
IV.	Miscellaneous works:-			
	a) Grading of canals 40 grades @ 900/- mile.			750/-
	b) Farm drainage and silt traps @ 3300/- "			2,750/-
	c) Service roads @ 3600/-			3,000/-
	d) Planting avenue trees @ 500/-			420/-
	e) Final survey before execution.			200/-
	f) Soil and malarial surveys.			800/-
	g) Water supply and sanitation.			1,000/-
	h) Colonization of agricultural labour.			3,000/-
	i) Buildings.			10,000/-
	j) Miscellaneous and rounding.			420/-
				22,340/-
V.	Protection to slopes of channel 20 grades @ 2500/-			50,000/-
	Total of items I to V.		Rs.	13,44,000/-
	Acquisition charges:-			
	a) Compensation for lands 33 acres @ 200/-	6,600		
	b) Amount of land revenue @ Rs 20/- acre	660		
	c) Statutory allowances @ 15%	990		
	d) Miscellaneous acquisition charges.	500		
	e) Establishment @ 7½	330		
	f) Miscellaneous and rounding.	920		
		10,000		10,000/-
	Contingencies @ 5% on Rs 13,44,000			67,200/-
	Soil supervision @ 1%			13,440/-
	Temporal establishment @ 7½%			1,00,800 -
	Tools and Plant @ 1%.			13,440/-
	Miscellaneous and rounding.			11,120/-
			Total Rs.	15,60,000/-

Recommended
Executive Engineer,
Survey and Designs Dn.
Hyderabad.

Superintending Engineer,
Tungabhadra Valley Circle.
M.P.Project.

Chief Engineer
Major Irrigation
South, Bangalore

Earthwork excavation:			
a) Contour [illegible]	1,76,505 units	@ 7/8/-	13,24,338/-
b) [illegible]R2 common	6,013 "	@ 7/8/-	45,098/-
c) Saddle	26,922 "	@ 12/-	3,23,064/-
(d) Maintenance during execution @ 600/- per mile.			2,400/-
(e) Miscellaneous and rounding			3,350/-
		Rs	17,00,000/-
Embankment.	1000 units @ 10/-		10,000/-
Masonry works:-			
Approach wall at	0-5-220	1,12,100	
Road bridge	0-6-110	18,000	
Minor bridge	1-3-0	1,31,420	
Cart bridge	1-2-0	12,000	
-do-	2-2-140	12,000	
-do-	3-1-110	12,000	
-do-	6-2-550	12,000	
Relieving weirs 1113 Rft @ 75		83,475	
Inlets 394 Rft @ 70/-		27,580	
		4,20,575	4,20,575/-
Miscellaneous works:-			
(a) Grading of canals @ 900/- per mile.			[illegible]/-
(b) Storm drainage and silt trap @ 3,300 /mile.			10,000/-
(c) Service roads @ 3,600/- a mile.			1,000/-
(d) Planting avenue trees @ 500/-			5,000/-
(e) Final surveys before execution.		L.S.	1,200/-
(f) Soil and malarial surveys.		L.S.	2,000/-
(g) Water supply and sanitation.			12,000/-
(h) Colonisation of agricultural labour.			10,000/-
(i) Shifting of villages such as Somasettihalli & Aracanghatt			120,000
(j) Formation of village sites & approach roads		L.S.	10,000/-
(k) Buildings for a sub division.			[illegible],000/-
(l) Miscellaneous and rounding.			4,000/-
			25,[illegible]/-
Protection to slopes of channel in soft soils: 2 miles @ 2500/- /grade.			10,000/-
Total for items I to V.		Rs.	2,[illegible],675/-
VI. Acquisition of lands:			
(a) Compensation for lands @ 200/- acre for 243 acres = 48,600/- + wet 10 acres @ 800/- = 8,000= 56,600/-			[illegible]/-
(b) Abatment of land revenue @ 20/- for 237 acres			[illegible]/-
(c) Statuatory allowances @ 15%			8,490/-
(d) Miscellaneous acquisition charges.		L.S.	2,000/-
(e) Establishment @ 5%			2,840/-
(f) Miscellaneous and rounding.			1,000/-
			76,[illegible]/-
VII. Contingencies @ 5% on items I to V.			[illegible],[illegible]/-
VII. Petty supervision @ 1%			2,[illegible]/-
IX. Tools and plant @ 1%			[illegible]/-
X. General establishment @ 7½%			[illegible],[illegible]/-
XI. Miscellaneous and rounding.			[illegible]/-
		Total Rs	[illegible],[illegible],000/-

H.B. Ramanand 15/2

Executive Engineer,
[illegible].9 Survey & Designs Dn.
Bhadravathi.

R. Ghatge 15-2-57

Superintending Engineer,
Tungabhadra Valley Circle,
T.B. Project.

	Acquisition of lands:-	
(a)	Compensation for lands 673 acres:	
	Dry 603 acres @ 250/- = 165750/-	
	Wet 10 " @ 800/- = 8000 @	1,73,750/-
(b)	Interest of land revenue @ 20%	13,460/-
(c)	Territory allowances @ 15%	26,063/-
(d)	Misc. Acquisition charges L.S.	2,000/-
(e)	Establishment charges @ 5%	5,213/-
(f)	Miscellaneous and rounding.	514/-
		Rs. 2,21,000/-
VII.	Contingencies @ 5%	5,43,700/-
VIII.	Petty supervision charges @ 1%	1,08,740/-
IX.	Tools and plant charges @ 1%	1,08,740/-
X.	General establishment charges @ 7½%	8,15,550/-
XI.	Miscellaneous and rounding.	21,705/-
	Total Rs.	1,27,00,000/-

This covers the cost of Kolebomsur channel upto 12 i.e. 7 miles at a tiat Rs. 30.5 lakhs.

A.B. Ramamurthi
Executive Engineer,
C.D.9 Survey and Design Division, Bhavanisagar.

R. Y. Rao (15.2.57)
Superintending Engineer
Cauvery Circle, Bhavanisagar
B.L.Project.

Government of Mysore.

Mysore Government Secretariat,
Vidhana Soudha,
Bangalore, Dated: 4th April 1957.

From

The Secretary,
Standing Technical Advisory Committee, BANGALORE.

To

The Chief Engineer,
Major Irrigation (South), Bangalore.

SUBJECT:- Alternative alignment of Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel for crossing Shantisagar.

GOVERNMENT SECRETARIAT
NO. 1538
9 APR 1957
PUBLIC WORKS MAJOR IRRIGATION BRANCH

Sir,

I am desired to forward herewith the draft resolution passed at the Preliminary meeting of the Standing Technical Advisory Committee, held on 2nd April 1957, on the above subject and to request you to furnish within a course of week comparative cost of the three alternatives, having in view the several points raised by the members during the course of the discussions on that day.

Orders of Government in the matter of proceeding with the work on the alignment ACD indicated in para. 2 of the resolution, may be awaited,

Yours faithfully,

(H.Channiah,)
Secretary,
Standing Technical Advisory Committee.

Memo

Copy to the Assistant Secretary, M.I. Branch for information.

kk5457

8.4.57

SUBJECT.....

.....

.....

Diary No. of letter replied to.....

Mysore Government Secretariat

( )

the 195 .

Date of issue.....195 .

Signed by.....

May this be—

(i) printed?
(ii) treated as a Standing Order?
(iii) published in the Gazette, English Part?
(iv) translated?
(v) placed at the disposal of the Press?
(vi) published in the Gazette, Kannada Part?

Section

Serial No.

File No.

Proceedings of the Government of Mysore

Read— Correspondence ending with memo No 5002-3 dated 11.3.57 from the Chief Engineer Major Irrigation (South) Bangalore furnishing ~~(a certain)~~ particulars ~~Order thereon. No.~~ regarding the alignment of Bhadra Reservoir Right Bank Channel beyond Hirenalali Tunnel ~~for crossing~~ ~~Near Shantisagar~~ Valley. order No dated Bangalore. The area referred to above was inspected by the members of the

The Standing Technical Advisory Committee, After considering the several alternative alignments, (illegible) in the Index plan. The Committee have recommended that the alignment A C D from the exit (point A) of the Tunnel as indicated in the Index plan, may be adopted and that the work in this connection Section A.C.D. can be proceeded with, pending final decision on the alignment of the channel to cross the Shatisgan valley.

After a careful Consideration of the question, Govt agree with the recommendations of the S.T.A.C referred to above, and direct that the alignment A C D from the exit (point A) of the

List of Enclosures.

Copied by

Examined by

pendix F. G.—1]

BJECT.....

.....

.....

Diary No. of letter replied to .....

Section

File No.

Mysore Government Secretariat.

Serial No.

No.

To

Date of issue.....

Signed by.....

To Tunnel as indicated in the ~~as per~~ index plan

~~enclosed~~ Should be ~~drafted~~ adopted and the work in this portion may be taken up for execution By order

for Secy to Govt PWD.

To

The CE Hrs (S) Bangalore.

The S.E.T.B.V.C Lakshmanthirtha

Copy to Secy S.T.A.C for information

10/4/57 10/4/57

List of enclosures .....

Copied by.....

Examined by .....

WD 03736-GPB—P.Z.S.— 50,000—1-3-56

3 C

PROCEEDINGS OF THE GOVERNMENT OF MYSORE.

Read:-

Correspondence ending with Memo No. 5002-3 dated 11-3-1957 from the Chief Engineer, Major Irrigation (South) Bangalore furnishing particulars regarding the alignment of Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel, before crossing Shantisagar valley.

Order No.PWD

Bangalore, dated, April 1957.

The area referred to above was reported to have been inspected by the majority of the members of the Standing Technical Advisory Committee and ~~After considering the several alternative alignments,~~ ~~But however,~~ the S.T.A.C was of the unanimous opinion ~~the Committee have recommended,~~ that the alignment A C D from the exist (point A) of the Tunnel as indicated in the index plan, may be adopted and that the work in this ~~common~~ Section A.C.D. can be proceded with, pending final decision on the alignment of the channel to cross the 'Shantisagar Valley', from the point D onwards.

a Final decision on the main alignment of the channel could not be taken by the S.T.A.C at its meeting held on 2.4.57.

Typed ltr at page 31.

After a careful consideration of the question, Govt. agree with the recommendations of the Standing Technical Advisory Committee referred to aboe, and direct that the alignment ACD from the exist (point A) of the Tunnel as indicated in the index plan should be adopted and the work on this portion may be taken up for execution.

By order,

11.4.57

(K.B. Murarappa),
for Secretary to Govt. P.W.D.

PTO

PROCEEDINGS OF THE GOVERNMENT OF MYSORE.

R e a d -

Correspondence ending with Memo No.5002-3 dated 11-3-1957 from the Chief Engineer, Major Irrigation (South) Bangalore furnishing particulars regarding the alignment of Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel, and before crossing Shanthi Sagar Valley.

Order No. PWD 14 BRPS 57

Bangalore, dated, 17th April 1957.

The S.T.A.C. was of the unanimous opinion that the alignment A C D from the exist (point A) of the Tunnel as indicated in the index plan, may be adopted and that the work in this section A.C.D. can be ~~proposed~~ proceeded with, pending final decision on the alignment of the channel to cross the 'Shantisagar Valley', from the point D onwards.

After a careful consideration of the question, Govt. agree with the recommendations of the Standing Technical Advisory Committee referred to above, and direct that the alignment ACD from the ~~exist~~ exit (point A) of the Tunnel as indicated in the index plan should be adopted and the work on this portion may be taken up for execution.

By order,

(K.B.Murarappa),
for Secretary to Govt. P.W.Dept.

Issued
17 IVI 57

To

The C.E. M.I. (S) (with index plan)

The S.E. T.B.P.C. Lakkavalli,

Copy to Secretary, S. T.A.C.

[illegible] GOVERNMENT OF [illegible]

---

ondi-

Correspondence ending with Memo No. 3002-5 dated 11-3-1957 from the Chief Engineer, Major Irrigation (South) Bangalore furnishing particulars regarding the alignment of Bhadra Reservoir right bank Channel beyond Hirematti Tunnel and before the crossing Chanthi Nagar Valley.

Order No.LD 14 [illegible] 57

Bangalore, dated 17 April 19 7.

The Standing Technical Advisory Committee are of the unanimous opinion that the alignment [illegible] of the entire unit (Points ..) of the Channel as indicated in the index plan, may be adopted and that the work in this section immediately can be proceeded with, pending final decision on the alignment of the Channel to cross the 'Chanthinagar Valley' , from the point D onwards.

Flag 'T' Ref.

After a careful consideration of the question, Government agree with the recommendations of the Standing Technical Advisory Committee referred to above, and direct that the alignment [illegible] from the unit (point A) on the Tunnel as indicated in the index plan should be adopted and the work on this portion may be taken up for execution.

By order,

(K.S. Murugesan),
for Secretary to Government,
Public Works Department.

To

The Chief Engineer, Major Irrigation (South), Bangalore.
The Superintending Engineer, Bangalore Valley Circle, Bellary.
Copy to Secretary, Standing Technical Advisory Committee.

S/copy.

PWD/4 BRP 57 (1)

PROCEEDINGS OF THE GOVERNMENT OF MYSORE.

Read -

G.O.No.PWD 14 BRP 57 dated 17-6-57. directing that the alignment ACD from the exit (point A) of the tunnel as indicated in the index plan should be adopted and the work on this portion may be taken up for execution pending final decision on the alignment of the channel to cross the 'Shantisagar Valley' from the point 'D' onwards.

ORDER NO.PWD 14 BRP 57,

Dated, Bangalore, 22 JULY 1957.

3 Broad alternatives proposed

*

1) taking both Davangere and Malebennur channel in contour above the water spread of the Shantisagar tank.

2) to run the main canal up to the saddle on the left side of Shantisagar tank and then from there bifurcating into Malebennur and Davangere and taking Davangere channel behind Shantisagar tank by means of an acqueduct or syphon.

3) Dropping Bhadra Reservoir Right Bank Main canal into Shanti-sagar tank and drawing off therefrom the Malebennur and the Davangere branches.

(1) to take Davangere branch channel in a flume over or bund of Shantisagar bund.

After two spot inspections by the members of the Standing Technical Advisory Committee, the question of deciding the alignment of the Bhadra Reservoir Right Bank Channel to cross the Shantisagar Valley from the point D came up for discussion at the thirty-third meeting of the S.T.A.C. held on 10-7-1957. The Relative merits and demerits of the ~~three~~ four broad alternatives ~~proposals~~ ~~as detailed~~ indicated in the*margin were discussed. ~~While~~ the committee were generally opposed to alternative 1 and 3, they ~~generally~~ favoured ~~the proposal~~ alternative No.2 ~~as detailed in the margin~~. Even under the proposal No.2, there ~~were~~ are two further alternatives namely:

(i) Taking the Davangere branch behind the Shantisagar bund by means of a syphon or an acqueduct,

(ii) Taking the Davangere channel over the Shantisagar bund itself by means of a trough.

There was divided opinion; some favoured alternative (i) of the proposal 2, while some ~~favoured~~

The first and last alternative were proposed to be dropped and it was agreed that the second and third alternatives ~~and further~~ should be considered after some further investigations.

favoured alternative (ii) of the proposal 2. Final decision could not be taken as further investigation was proposed to be taken up. But However, as the point R1 in the main channel is common to both these alternatives of proposal No.2, the committee were of the unanimous opinion that the work of the main channel upto the point R1 and the Malebennur channel from the point R1 may be proceeded with pending final division between the alternatives of the proposal No.2.

Government agree with the recommendations of the S.T.A.C. referred to above and direct that the work of the main channel from D to R1 and the Malebennur branch channel behind the point R2, as shown in the plan (annexure to the G.O. read in the preamble) may be continued in the higher contour with reference to the level realised at the tunnel exit.

By Order,

Under Secretary to Govt.,
P.W.(D).

To

The Chief Engineer, M.I.(South),

The S.E., T.V.C., BRP Post, Via Birur.

Copy to the Secretary, S.T.A.C. for information.

File No. 14-BRP-57 1459 P.W.A.

Appendix F. G.—1]

SUBJECT Alignment of the Bhadra Reservoir Right Bank Channel beyond Hiremalali Tunnel for crossing Shanti Sagar Valley

Diary No. of letter replied to .....

Section

File No.

Serial No.

Mysore Government Secretariat.

( )

the 195 .

Date of issue.....

Signed by.....

List of enclosures .....

Copied by.....

Examined by .....

No. PWD 14 BRP 57 dt 7.2.57

To

The C.E.N.I (S) Bhdra

Sir

I am directed to forward herewith an extract from the proceedings of the preliminary meeting of the S.T.A held in the Chambers of the Chief Engineer major Irrigation (S) Bangalore on 29th Dec 56 regarding the above Subject and to request you kindly to furnish the particulars referred to therein to the Secy of that Committee immediately and a copy there of to this office, So that further action may be taken

WD-05447-GPB—P.Z.S.— 30,000-29-3-56.

Encl. IV

H. ANANTHACHAR, B.E., A.M.I.E. (Ind),
Chief Engineer (General) of Mysore (Retd),
& Member S.T.A.C.

Bangalore,
Dated, 21-10-57.

To

The Secretary,
S.T.A.Committee,
BANGALORE.

Sir,

I write to state that due to some unavoidable circumstances I will not be able to attend the meeting today. I have already expressed my views in the preliminary meeting yesterday regarding the alignment of the B.R.B.Channel across Shanti Sagar Valley. I am emphatic in my views that it is dangerous to take the channel on the tank bund by a duct considering the nature of soil the tank bund is composed of as revealed by trial pits. There is bound to be leakage of water from the duct and ~~into~~ with an uncertain bund and ~~into~~ with leakage from above which may occur at any time, the results will be desastrous not only it will lead to heavy damages, but it will trow out of irrigation a vast extent of land and any repairs will be a major work involving a lot of time. Further there is not much difference in cost between the duct and a Syphon or an aqueduct. An old tank is itself a source of anxiety and to introduce one more element of risk by a duct over the bund which is prone to leakage some day or other is introducing double risk. All modern Irrigation structures should be designed such that they stand for centuries and all possible element of risk avoided even if it be at a greater cost. I do not therefore agree to the proposal of taking the channel over the tank bund. I am definitely of opinion that the channel has to cross the valley behind the tank at a convenient distance either by an acqueduct or a syphon. I have no objection for the Syphon if it means lesser cost.

The above may kindly be placed before the Committee as my final opinion in the matter.

Yours sincerely,

Sd/- H.Ananthachar.

" Copy "

NO.COPP/SLP/MN/22

M.Narasimhaiya.
Member, I.& P. Team,
Committee on Plan Projects,
85, Kotah House,
Shahjahan Road,
New Delhi, + Member Standing Tech Advisory Committee Mysore State.
25-10-1957.

My dear Shri Srinivasachar

Bhadra Reservoir Project
Alignment of Right Bank
Channel beyond the tunnel.

SECRETARY TO GOVERNMENT
Date 28/10/57
PUBLIC WORKS & ELEC. DEPTT.

In view of the importance of the proposition under consideration of the Government for the Right Bank Channel crossing the Bhantisagar Valley, I have taken the liberty to address this letter.

It is obvious that repetitions of expressions such as 'grave danger' and vehemence in language would not add to the arguments in favour or against a proposition but rather give a feeling of the weakness of the position taken up by those experts.

The two reasons adduced against the duct on the bund are :

1) Safety of the bund &

2) difficulties in execution.

The safety of the bund is jeopardised in their view due to possible leaks in the duct and consequent slipping of the rear slope and washing away of the bund. This is too far fetched. As mentioned by some of us, it is not beyond the capacity of our engineers to design and execute a leak proof R.C.duct. Good quality of work demands such works to be so built. In fact several aqueducts have been built in R.C.C. over in Mysore State and no trouble from leaks has been experienced. Even should there be such leaks, they would not be

of such an order as to create conditions of saturation of soils in the bund to cause slipping. Further the design provides for draining away small leaks if any. Watertight joints and satisfactory execution of these drainage outlets should be ample measures against the apprehended "danger".

The existence of bouldery soil in the top of the bund does not alter the position to any extent. Numerous instances are available where structures are built on such soil providing proper base to distribute the load and reduce it to safe limits with provision against settlement. The question of vibration was also mentioned during discussions; but this may be ignored as several R.C.bridges have been constructed with fast moving vehicles going over it. The structure that is now proposed to put up is comparatively a very light one and there need be no apprehension on this account.

The margin between the full tank level and the top of the bund is quite large and the excavation in the bund for the duct will not effect the safety in any manner. As for the rains during execution and the possible soaking in of water, it is only small sections of lengths that would be taken up for work and proper drainage arrangements would naturally be made. In regard to the collections of materials etc., there is adequate room for storage and other arrangements . Comparatively smaller quantities of steel and cement are required and proper planning would suggest the collection of these materials in advance. There is no difficulty in procurement of these small quantities either.

As rightly pointed out by Shri.Nilkanthappa, the construction of a syphon behind the bund in the soiden ground on proper foundations is beset with considerable difficulties. Piles have to be precast and driven in the saturated soil to hard soil. The uniform depth now assumed viz. 40 ft. could easily be greater. No data of test pits are available for determining these depths. It is quite probable that the estimate for the syphon will have to be revised to provide for heavy excesses.

There is overwhelming technical opinion in favour of the duct on the bund. Apart from the Team of Engineers, the Consultative Committee comprising Sarvashri A.N.Khosla, M.S.Thirumale Iyengar, R.K.Gupta and N.N.Iengar, unanimously and severally have supported this proposition. I may also mention that Dr.K. L.Rao, Member, Designs and Research, Central Water and Power Commission, prefers this proposal.

In view of the above circumstances and of the simplicity and straightforwardness and absolute safety and the probability of the syphon behind the bund proving difficult and costlier than at present estimated not being in any way proving quite safe, I would strongly recommend and urge the adoption of having the R.C.Duct on the Bund.

With high regards,

I am,
Yours Sincerely,
M. Narasimhaiya
(M.Narasimhaiya)

Shri. D.K.Srinivasachar, I.A.S.,
Secretary to Government,
Public Works Department,
Mysore State,
Bangalore.

No. COPP/I&P/MN/23

M.Narasimhaiya.

Member, I.& P. Team,
Committee on Plan Projects,
& Member, S.T.A.C.Mysore State,

85 Kotah House,
Shahjahan Road,
New Delhi

26-10-1957.

My dear Shri Srinivasachar,

In continuation of my D.O.letter No. COPP/I&P/MN/22 dated 25-10-1957, regarding the Right Bank Canal crossing across the Shantisagar Valley, I wish to note below a slight correction in page 2 thereof.

Instead of the sentence commencing from line 17 viz. " The structure that is now proposed to put up is comparatively a very light one and there need be no apprehension on this account " please read:

" The structure that is now proposed to be put up though comparatively a light one, could be designed against these minor vibrations and there need be no apprehension on this account.

With regards,

I remain,

Yours Sincerely,

M. Narasimhaiya

(M.Narasimhaiya)

Shri. D.N.Srinivasachar, I.A.S.,
Secretary to Government,
Public Works Department,
Vidhana Soudha,
Bangalore.

41

D.O.No.PWD 14 BRP 57

Dear Sri, Krishnaswami Mudaliar.

Sub: Alignment of the Right Bank Channel for crossing the Shanthisagar Valley. B.R.P.

You may kindly recall to the discussions that have taken place at the meeting of the S.T.A.C. about the alignment of the Bhadra R.B.Channel across the Shanthisagar valley. Among the several alternatives that were originally thought of, only two now remain for consideration. One is the construcion of an R.C.C.Duct over the bund, and other the construction of a siphon or aqueduct across the halla behind the bund. These two alternative alignments have been inspected by the Minister for P.W.D. recently, at the time of the meeting of the B.R Special Committe

As the S.T.A.C. did not take an unanimous decision on this issue and as t is a matter which is purely technical in character, Govt. consider that the matter should be left to the decision of the Chief Engineer incharge of the project for being decide on technical grounds, taking into consideration, the opinions advanced on both sides by the members of the S.T.A.C.

I am, therefore, to request you to take an urgent decision on this issue based on the opinions furnished, and in the light of your experience and knowledge in this particular field of Engineering. If the decision were to be

in favour of the alignment, behind the bund, the question of having either a siphon or an aqueduct may also be decided by you.

The matter may kindly be treated as very urgent and decisions taken by you may be intimated to Govt. for information.

Yours sincerely,

(B.S.S)

To

Sri C.R.Krishnaswamy Mudaliar, B.E.,
Chief Engineer, Major Irrgn.(S)
Bangalore.

Copy of the above is forwarded to the

Superintending Engineer, Tunnel Circle, Tunnel site
Channagiri Taluk for information.

Copy to Secretary, S.T.A.C. for information.

Krishnaswamy Mudaliar, B.E.,
~~ANTHACHARX B.EX~~
~~A.M.I.E.(Ind.)~~,
Engineer of Mysore, Major Irrgn.,(S).

PUBLIC WORKS DEPARTMENT,
CENTRAL OFFICE,

Bangalore-1, Decr. 5, 1957.

MYSORE GOVERNMENT SECRETARIAT
PUBLIC WORKS MAJOR IRRIGATION BRANCH
G.P. No. 230
- 7 DEC 1957
8478

SECRETARY TO GOVT.
Date 5/12/57
PUBLIC WORKS & ELEC. DEPTT.

Confidential

Dear Sri Srinivasachar,

Sub: Alignment of the Right Bank Channel for crossing the Shantisagar Valley, B.R.P.

With reference to D.O. letter No.PWD 14 BRP 57 dated the 29th November 1957 of Sri B.S.Srikantiah regarding the above subject, I write to state that after examining the question of the alignment of the Right Bank Channel for crossing the Shantisagar Valley in all its aspects, I consider the proposal of crossing the valley behind the bund, either by means of ~~a~~ a siphon or an aqueduct, to be the one suited for adoption in this place. The local officers are also in agreement with my view. Hence I am issuing instructions to the Superintending Engineer, Bhadra Tunnel Circle, to proceed with the work on the Davangere Branch Channel on this basis.

I am getting comprehensive detailed estimates prepared for the alternative proposals of crossing by means of a siphon or an aqueduct, and after a full examination of all the details in relation to their relative merits, whichever proposal is found more suitable will be decided upon for adoption.

Approval of Government may kindly be communicated for the action taken by me on the above lines.

Yours sincerely,

5/12/57

Sri D.K. Srinivasachar, I.A.S.,
Secretary to Government,
Public Works Department,
Bangalore.

53

MPW.1102 dy 13-12-57

Dear Shri.Gadgil,

With reference to the telephonic talks we had a few days ago about the alignment of the Bhadra Right Bank Channel across Shantisagar Valley, I am enclosing a brief note prepared on the subject for your information as desired by you. I am sure you will agree that in a purely technical matter like this, it would be wise for a lay Government to leave the decision to the officers on the spot who are charged with the responsibility of executing the work provided, of course, they take into consideration all the circumstances and the views expressed by other technical authorities. I am satisfied that the Chief Engineer in charge of the project has given due consideration to ~~them~~ the circumstances and views before coming to the decision referred to in the note. You will perhaps agree also that a little more expenditure on account of the alignment now chosen would be justified in as much as dependability of construction has to have priority of consideration over cost in such cases.

I must say, however, that we are very grateful to the Team and the Members of the Consultative Committee for the trouble they have taken in giving such close consideration to this important matter and in giving us the benefit of their views.

I am confident that we will continue to have the same assistance and co-operation from the Team and the Committee as in the past.

With best regards,

Yours sincerely,

(M. PW) 18/12

H. K. VEERANNA GOWDH
Minister for Public Works.

BANGALORE, 55
Dated 13th Dec. 1957.

MPW. 1102/Gen 3.

Dear Shri Gadgil,

With reference to the telephonic talks we had a few days ago about the alignment of the Bhadra Right Bank Channel across Shantisagar Valley, I am enclosing a brief note prepared on the subject for your information as desired by you. I am sure you will agree that in a purely technical matter like this, it would be wise for a lay Government to leave the decision to the officers on the spot who are charged with the responsibility of executing the work provided, of course, ~~that~~ they take into consideration all the circumstances and the views expressed by other technical authorities. I am satisfied that the Chief Engineer in charge of the project has given due consideration to these circumstances and views before coming to the decision referred to in the note. You will perhaps agree also that a little more expenditure on account of the alignment now chosen would be justified in as much as dependability of construction has to have priority of consideration over cost in such cases.

I must say, however, that we are very grateful to the Team and the Members of the Consultative Committee for the trouble they have taken in giving such close consideration to this important matter and in giving us the benefit of their views. I am confident that we will continue to have the same assistance and co-operation from the Team and the Committee as in the past.

With best regards,

Yours sincerely,

13/12

Shri N.V.Gadgil,
Leader of the Irrigation & Power Team,
Committee on Plan Projects,
Planning Commission, Govt. of India,
NEW DELHI.

The question of first determining the alignment of the Bhadra Right Bank Channel across the Shantisagar Valley in Channagiri Taluk has been under consideration for some years now, almost ever since the execution of the project came to be accelerated under the First Five Year Plan. A number of alternatives ~~as many as five or six~~ were put up considered even at ~~from~~ the commencement, and after consideration by the Standing Technical Advisory Committee, ~~almost~~ all of them except those relating to the dropping of the canal waters into Shantisagar and to the taking of the channel across the valley in the rear, were dropped. In the meantime, the Members of the Consultative Committee for Irrigation and Power constituted by the Committee on Plan Projects and the Planning Commission Team for Bhadra Project visited the project during May 1957. The Committee and the Team after inspection met the members of the Standing Technical Advisory Committee on 18-5-1957 and had informal discussions with the Members. A suggestion was made at that time that the State Technical Advisory Committee might consider the proposal of taking the channel over the bund of Shantisagar by means of an R.C.C. Duct. This suggestion was ~~discussed~~ examined by the Members of the Standing Technical Advisory Committee at a meeting held on 10th July 1957. After a great deal of discussion, it was resolved that trial pits might be dug on the bund of the tank along the proposed alignment of the R.C.C.Duct with a view to investigating the nature of the soil and determining if the laying of the duct on the bund is feasible. The relevant portions of the proceedings of the Committee ~~is~~ in enclosed.

It followed from the discussions at this meeting that only two alternatives remained for consideration, namely, (i) taking the channel behind the bund and (ii) taking it over the bund.

Soil tests were accordingly conducted on the Shantisagar bund and it was found that ~~the bund~~ it consisted only of loose earth and boulders up to a depth of about 20-25 ft. It appeared from these tests that the whole bund was constructed not with any compacted material but with boulders, earth and debris thrown in without any consolidation. The results of these tests were circulated among the Members of the State Technical Advisory Committee and the subject came up again for discussion at their meeting held on 21st October 1957. At this meeting, the opinion of the Members was almost equally divided between the two alternatives, namely, taking the channel behind the bund ~~either~~ by means of an aqueduct or ~~by means of~~ a siphon and taking it over the bund. ~~There was no unanimous decision on the issue and the matter~~ was left to Government for decision.

While the ~~matter~~ question was under consideration ~~by~~ Government in consultation with the Chief Engineer in charge of the project, the draft Final Report of the Planning Commission Team recommending the Duct proposal was received on 18th November 1957. The State Government took into consideration the opinions of the Members of the Standing Technical Advisory Committee and the views of the Planning Commission Team and felt that as this was a purely technical

61

matter, it should be left to the Chief Engineer in charge of the project for a decision, after taking into account the views expressed by the Team and by the Members of the Standing Technical Advisory Committee. The Chief Engineer in charge of the Project has reported that after taking all the circumstances into account and in the light of his personal experience and knowledge, he would consider the proposal of taking the channel behind the bund, instead of on the bund, as the one suited for adoption in the place. In coming to this conclusion the Chief Engineer has had in view also the fact that when the Planning Commission Team visited the Project area no soil tests in regard to the composition of the bund had been made and that the tests subsequently conducted revealed the possibility of risk in taking the channel over the bund. The technical reasons for adopting the alternative have been fully borne in mind by the views of the STAC as may be seen from the relevant proceedings (enclosed). It may be mentioned in this connection that during the meetings of the Standing Technical Advisory Committee it was agreed on all hands that in a matter like this, the question of cost should not be the main consideration and that dependability of the structure should have priority of consideration in view of the large extent of irrigation beyond the tank. All the three serving Chief Engineers who are members of the STAC and who participated in the discussions of the ~~Standing Technical Advisory~~ Committee and in the inspections conducted from time to time have also been of the opinion that the alternative of taking the channel behind the bund should be adopted. The Chief Engineer in charge of the Project is reported to have been guided by these considerations as also by the reports and views of the local Officers in

charge of the Project in coming to the conclusion that the alignment of the channel should be behind the bund instead of on the bund.

The Planning Commission Team led by Shri N.V.Gadgil have made it clear from time to time that their suggestions with regard to technical matters pertaining to the Project are purely for the consideration of the State Government and the technical Officers of the State and that the Team have no desire to impose any decisions of theirs on the authorities executing the Project. In the light of this assurance also, the State Government have considered it proper to leave the decision to the Chief Engineer in charge of the Project; although they have insisted on the suggestions made by the Team, and the opinions advanced by the members at the meetings of the Standing Technical Advisory Committee being given careful consideration before arriving at a final decision. The State Government have every reason to believe that due regard has been paid by the Chief Engineer to all these considerations and feel that the further execution of the work may go ahead in accordance with the decision taken by the Chief Engineer.

OFFICE OF THE MINISTER FOR PUBI

CM PH

Sri M. N. Lakshmana Rao & Sangadhara have revised their earlier opinion in favour of taking the channel in the Bund and have preferred a direct one after said Aditya Nilwad. a saddhana. Is it not necessary to draw his attention Shri Gadgil to this fact? It speaks

A slight modification has been made at Page 2 of minute (Min PW) 5/3/n

12/12

Proceedings of the Thirty-third meeting of the Standing Technical Advisory Committee held in the Chambers of the Minister for Public Works on 10th July 1957 at 3-30 p.m.

****

Present:-

1. The Minister for Public Works (Chairman).
2. The Secretary to Government, P.W. & Elec. Dept.
3. Shri M.G.Rangaiya, B.A., B.E.
4. " B.S.Narasinga Rao, B.A., B.E.
5. " M.N.Lakshmana Rao, B.A., B.E.
6. " N.Neelakantappa, B.A., B.E.
7. " K.S.Gangadhara, B.E.
8. " V.Ganesh Aiyar, B.A., M.I.E., M.I.M.E.
9. The Chief Engineer (General)
10. The Chief Engineer, Major Irrigation (South).
11. Shri H.Channiah, B.E. (Secretary)

(1) Confirmation of the proceedings of the Thirty-second meeting held on 30th December 1956.

Working Tables for the Bhadra Project.

It was stated that the working tables had been prepared by the Department and was placed before the Sub-Committee appointed for the purpose. The Sub-Committee could not finalise them at their previous meeting as the Chief Engineer (Electricity) could not attend that meeting. Since his opinion was necessary in connection with the quantity of water allotted for power purposes, it was proposed to be finalised at the next meeting of the sub-committee.

It was pointed out by the Secretary, P.W.D. that this was an urgent matter since the Government of India and the Tungabhadra Board also had been asking for the working tables and should be finalised soon.

The Chairman said that the Sub-committee meeting may be convened as quickly as possible, say by the end of July and a decision taken on this subject.

Santekadur Valley Acqueduct.

It was noted that the work had been completed and water allowed in the acqueduct.

Tunnel machinery.

It was explained by the Secretary, P.W.D. that

in view of the present foreign exchange difficulties the question of obtaining the machinery available with local firms and those which are surplus to the requirements of the other projects in India was explored. Keeping the requirements of both Bhadra and Sharavathi projects a Team of Engineers had been sent by Government to Bhakra-Nangal Project where certain machinery were stated to be available for being spared to other projects. The Chief Engineer, Major Irrigation (South) had prepared a list of machinery that could be procured locally without asking for any foreign exchange. The purchase of machinery which could not be procured from any of the above two sources was under consideration of Government and it was proposed to prevail upon the Government of India to make available foreign exchange to the extent that is absolutely necessary. At the instance of the Finance Department the question of getting the tunneling work done by the Mining Authorities was also examined. The Managing Director together with his experts and the Chief Engineer inspected the spot some time back and they were finally of the view that the Mining Undertakings could not take up this work, which should be executed only by the P.W.D.

Estimate for Rs.24.42 crores for Bhadra Project.

It was understood that the Sub-Committee constituted for the purpose had finalised the items relating to Dam, Left Bank Channel and the first section of the Right Bank Channel and that the estimate for the portion of the Right Bank Channel beyond the tunnel had not yet been reviewed by them.

The Chief Engineer, Major Irrigation (South) was requested to submit to Government such of the estimates as had been reviewed by the Sub-Committee so that

parts of estimates could be sanctioned and regularised.

Extension of the Tunga Left Bank Channel beyond 63rd mile.

The Superintending Engineer, Tungabhadra Valley Circle, stated that he had asked for additional staff for carrying out the investigation about fully utilising the available waters as required by the S.T.A.C., but he had been asked to find the staff by diverting them from other works. He said he would take up this work shortly.

Programme of works for Bhadra Project for 57-58.

The Secretary, P.W.D. said that when this question came up before the Bhadra Special Committee, they resolved that the Chief Engineer should draw up a revised programme so that the entire amount of the estimate may be spent and the work completed within the Second Plan Period.

The Chief Engineer was requested to expedite the submission of the revised programme.

The proceedings were confirmed with the above observations.

(2) Alignment of the Bhadra Right Bank Channel beyond Hiremalali Tunnel.

The Secretary of the Committee said that Committee had inspected the spot on 17-3-57 and had discussions about the alternatives at their preliminary meetings held on 2nd April and 15th June 1957 (Copies of proceedings enclosed). He also read a brief resume about the opinion expressed by the members and the decision taken by the Committee.

Shri Narasinga Rao stated as follows:-

" I have heard the report read by the Secretary. It is very necessary to explain the reasons in great detail for the stand that I have taken. Before doing so, I wish to inform my friends who were not members

of the Committee in 1947 that this subject was the first item that was discussed by the S.T.A.C. in their very first meeting after the works were started in 1947. All these four alternatives, contouring round the water-spread, dropping into the tank as proposed in the project, taking the channel on the bund and taking the channel behind the tank were discussed. They did not favour the dropping nor the crossing on the tank bund and they decided that the other two alternatives, contour and taking the channel behind the bund may be examined in conjunction with and suited to the best tunnel alignment. Davangere Channel in rear of the bund will completely avoid the Sulekere Tank. (Vide page 13 para 5 of the report of Bhadra Project).

Here Mr.Rangaiya observed that the 1947 proposal was quite different because the channel was to be started 90 feet above bed at the reservoir. This would have involved the cutting of the bund for more than 20 feet deep. The present proposal is to start the channel at 100 feet i.e. 10 feet higher. The 1947 discussion has therefore no bearing on the present proposal.

The resume of the discussions put up by the Secretary reveals clearly that all the above four alternatives were not placed at the same time before the Standing Committee during their inspections of the same area, twice, to assess the correct position out of the maze of figures. Only three proposals excluding the alternative of carrying the channel on the tank were placed during their inspections and they took a decision after discussing the mertis of the three proposals.

77

Fourth proposal i.e., on the tank bund was not before the Committee during the inspections. If Chief Engineer had felt this is another alternative as he seems to have now felt, he should have put this with the other three proposals. The team would have had the views of the Committee on all the four proposals. It is inexplicable to me, why the Chief Engineer did not do so (Place all the four proposals) in the first instance before the Standing Committee instead of placing first the same before the team of Government of India unless it be is because the team did not favour the proposal of dropping with which he had identified himself. The proposal of syphon was favoured by the Committee in their preliminary meeting held on 2-4-1957 by some members and not by all.

In this connection I wish to invite reference to the concluding para of the note on alternative alignments by the members of the Irrigation and Power Team of plan projects. They have stated that this proposal on the bund has found favour with practically all the members of the Standing Committee and the Project authorities. It is a very incorrect statement to put it mildly. This subject was brought up by the team, when members met the team in the Residency. All the members stated definitely that this was not before the Committee and they will re-examine the proposals on its merits if placed. In fact I told Mr. Honda the spokesman of the team that we have not agreed. The Superintending Engineer was against the proposal. I have brought this to the kind attention of the Minister lest Government might get the impression that we had favoured the proposal before them and that we are discussing merits and demerits behind them.

Turning to the subject proper, the committee have rejected the proposals of contour and dropping and have

approved that Malebennur channel might be aligned with the new level and executed straightaway.

The alternatives for discussion will be those for Davangere channel. The alternatives are (1) Trough over the bund (2) Channel in rear of the bund by syphon or acqueduct. The problem is the negotiation of a big dip behind the Sulekere bund. It is not across any flowing stream i.e. not a live valley with problems of the probability of future scour necessitating designs for foundation and unprecedented flood disposal. In all these proposals, I may bring to the kind notice of members that a separate provision of an acqueduct at a cost of 4.35 lakhs has been made for crossing the Sulekere waste weir valley. The proposals are therefore to negotiate a dry deep low bit of the original valley. Further after good deal of discussion on the omissions in the one proposal, and additions to the other, the Committee have opined that all the alternative proposals cost the same practically. Let me examine the proposal in this context.

Regarding trough it is a novel idea in India and in Mysore at any rate, of taking a big channel on the bund of a deep tank in service. I have seen channels taken on earthen bank and I know with what results. It was exemplified recently by the huge breach of the tank of the low level of Tungabhadra channel at the first flow of water. This proposal was not favoured by the Committee in 1947 as stated by me already.

This proposal on the bund has these disadvantages:-

1. It has potentiality of endangering the bund during execution. An open trench 21 x 11 for 1400 ft. has to be dug on the bund. Such a trench if left open (as it will be left open for sometime) what damage it can do during any rainy day (which is not under our control), I leave

this for members to ponder. This is enough to show that this proposal is not a sound one.

2. The elaborate arrangements needed to make the structure leak-proof and the preventing of roots of huge trees on the bund from becoming capillary tubes. With all these measures, one cannot be cent per cent leak-proof.

3. There is no elasticity in execution. In these days of difficulty of procurement of iron and steel there may be days of no work, while execution of this work has to be done round the clock.

4. There is restriction of working area and hardly any space for collection of materials. This adds to the construction difficulty.

5. The road from Channigiri to Davangere passes on the bund. Traffic has to pass on the bund only during construction as there is no possibility of diversion. Tank in front and deep gorge behind. The negotiation of traffic with the materials of excavated stuff and centering in the restricted space offer very difficult problem during construction.

6. To add to this, it offends the aesthetic value. This is a magnificient lake with wide water-spread. The trough sticks as continuous wall over the bund 8 feet high shutting all view of this lake. I cannot subscribe to this proposal on this one ground.

In these circumstances, with all respect to the elders in profession and with all the regard to the opinion of my friends I submit that it will be tragic indeed if channel is taken on the bund in as much as it has potentiality of endangering bund, difficulty of making the structure absolutely leak-proof, noclasticity in execution, construction of working space and the knotty problem of negotiating the traffic during execution; while the other proposal of syphon crossing is a straight forward

work with elasticity in execution, freedom of action, no uncertain factors to contend, the large working space and with equal cost if not less(I am positive it will be less).

I would like to say few words on the observations made by the members on the proposal of syphon. It is stated there will be air locks, ~~xxxxx~~ vibrations etc. This is not the type of raising the water over an obstruction (as in Kempabhudi tank). This is an inverted syphon. There can be no air lock, as the whole length will be below the energy line and will be no vibration as this whole length will be under positive pressure. No negative pressure at any point. (There will be air locks even in pipes under pressure when a pipe is emptied and refilled.) There are hundreds of syphon acqueduct etc., in the grand anicut canal and a dozen ~~x~~ of them in Marikanave left channel. The construction in this case is very easy. The structure will not be against any nalla or flowing stream. No diversion of water during construction. Straight forward work. I am positive that the proposal will be the most enonomical too, due to the facilities it has for execution. (To give an example, recently executed in Mysore, is the syphon on the Handi hall for the Shimsha power channel. The present problem is almost replica of the problem of this crossing. The problem is similar. Alternatives for crossing of the bund by an acqueduct over 100 feet piers, by syphon, by contour, by construction of a reservoir by bund were all examined and this Standing Committee approved the syphon. This is 1884 feet. long and difference of head is 104 feet and pipe of 7 feet diameter is laid simply on ground, just as penstock, anchored at the joints. The pipes syphon which is 911' diameter in this scheme can be laid on the ground and the head is much less nearly 70 feet. Tungabhadra workshop

have prepared large diameter pipes for these syphons.

In this connection, I would commend the words of the greatest Physicist with regard to the effect of fall out of nuclear tests. This Professor Marcus Miphant; Australian top nuclear scientist says " Much is made of the fact, that scientific opinion is divided regarding the effect of nuclear test. There is no such as rated dose of radiation (In this case rated dose of measures for leak-proof)." He reflected a very general sentiment when he said " as a Scientist I feel that when experts disagree one should play safely. I am positive that trough over the bund is very very risky, costlier, while the proposal of the syphon is the safest and is the most economical and can be constructed with ease.

I have expressed my misgivings, because the trough proposal is hemmed in by reservations and very uncertain factors. Hence for reasons which I have stated I say emphatically that it is highly tragic to take the channel on the bund and I am equally positive that syphon will be the most economical with no uncertain factors and straight forward work and will leave the Sulekere bund and tank undisturbed.

Shri K.S.Gangadhara said he would not agree that excavation in the bund for purposes of constructing a flume would endanger the bund as it was merely an excavation about 8 feet over the water level and even if it should rain during the course of execution of the work the water in the trench could be drained off. Referring to the construction difficulties of putting up a R.C.C. trough mentioned by Shri Narasinga Rao, Shri Gangadhara said that passage of traffic over the bund during execution of the work should not present any difficulty since the bund was wide enough to allow traffic even during execution of work, and the work could be so arranged that it could be carried out without obstructing the traffic. He

instanced the work of Arkavathi bridge where the road was widened without deviating the traffic. He said he would not agree with Shri Narasinga Rao in his statement that the syphon proposal and the trough proposal would cost about the same amount. The alternative of constructing an acqueduct was also not sound. He added that he was firmly of the view that the trough proposal was the cheapest as explained by him in his note furnished to the Secretary of the Committee and therefore preferred taking the channel over the bund.

Even when military conveyances were plying on the road.

The Chief Engineer (General) said that his main objection to the trough proposal was that an earthen bund was not leak-proof and further when an R.C.C. duct is taken over it the bund may sink. Even in the case of R.C.C. flume wherever there are expansion joints leaks develop in the joints. Even if the joints are made leak-proof by inserting steel pipes and conduits, the question of sinking of the bund will still be there. In order that an irrigation of nearly 150,000 acres of land under the tank may not be jeoparadised in the event of a mishap to the bund, he objected to the trough proposal and preferred an acqueduct behind the bund for crossing the valley. He added that high acqueducts even up to 100 ft. had been put up elsewhere in the country.

Shri Neelakantappa stated that the argument against the proposal to take the channel over the bund seemed to centre round the factor of absolute safety. Sulekere Tank Bund cannot be compared with other tank bunds which are designed for a top width of 10 to 20 feet. It had a top width of 150 feet and the bund had stood for a number of years and had consolidated itself very well. Even if half the width of the bund was washed out the rest of it should be able to stand the pressure.

If the Sulekere tank bund is not considered safe and were to fail, then even a siphon or an acqueduct constructed behind the tank would not be safe and might get washed away in the event of the bund giving way. The third point was about the extra load coming on the bund by introducing the trough. As pointed out by Shri Rangaiya the extra load was negligible compared to the vast botton width and the weight of the bund and as such there was no apprehension that there would be any further settlement of the bund. Referring to the aesthetic view, he added that since the trough would be put up in the rear of the bund a projection of about 8 feet at the back of the bund would not affect the aesthetic view, and the duct can be made to appear beautiful. Mr. Narasinga Rao stated that it is not in the rear of the bund but it is in front. Hence the main objection. Regarding the leaks from expansion joints in the duct, he said that suitable precautions can be taken to lead away the water by means of small drains, as after all the leaks may not be appreciable. Considered from all aspects he was of the view that there was no danger in the trough proposal as apprehended by some members and felt that this was the best and the cheapest proposal.

Shri M.N.Lakshmana Rao was of the view that iw would not be practicable to have a leak-proof duct as there would be a number of joints and on account of expansion and contraction there are bound to be leaks. When the duct was buried under earth the leaks will not be visible and would endanger the bund. The question of stability of the bund had also been raised. By capillary action and other considerations even though there was small weight over the bund, due to unequal settlement there may be danger to the bund. He therefore considered that it would be better to leave the bund alone and think of an

independent method of crossing the valley either by means of acqueduct or siphon. Acqueducts were generally preferred in cross drainage works because of certain inherent drawbacks in the siphon system such as the tendency to get silted up etc.

Shri Gangadhara remarked that the difficulty with regard to the acqueduct proposal was one of finding suitable foundation as good rock was not available even at a depth of 40 to 50 feet and the cost would be enormous if suitable foundations are to be secured.

Shri Ganesh Iyer said that Shri Neelakantappa had summarised his views. He also considered that that the proposal for a trough was the most suitable one.

Shri Rangaiya said that before the trough proposal was put up before the Committee he was in favour of dropping the channel into the Sulekere Tank as it would serve as a natural water duct. The main objection was dropping it from a height of 30 feet and as such this had to be given up. The other two proposals were the acqueduct and the concrete siphon. He would have preferred the siphon to the acqueduct because the acqueduct was too high. Now that the trough proposal was before the Committee he considered it more suitable. As regards the fears expressed by the members about the stability of the bund, Shri Rangaiya said that with his long experience regarding earthen bunds he could say that Sulekere Bund had no comparison with any other bund in Mysore. It was a hill saddle by itself and had lasted for centuries. Taking a duct over it will not endanger the bund as he pointed out at the preliminary meeting. While cutting open the bund the nature of the soil would be known and if the bund required strengthening necessary precautions could be taken. Even if there should be any leaks as apprehended by some members, the water could be drained off easily. Regarding construction difficulties,

if necessary meterials are kept ready the work can be completed in about four months and can also be so phased that it is completed before the rains set in. Even supposing the tank was full during execution of the work, the bund was wide enough and even half its width could stand the pressure of water. If any danger is apprehended, sluices could be provided in the waste weir and the water level in the tank can be reduced if necessary. As regards the aesthetic effect, the bund itself can be raised 10 feet and the entire length levelled up it would improve the view. He suggested that the Chief Engineer and some of the members might examine the plans and see if the duct could not be taken in the rear of the bund, in which case there would be no difficulty at all. He was therefore of the view that the proposal to take the channel over the bund by means of a duct was the best one and the construction difficulties can be overcome by having materials ready and by posting competent officers for the work.

Sri Gandadhara said that the point of aesthetic value raised by Sri Narasinga Rao was a very pertinent one. But it could be overcome by making the R.C.C.flume appear neat and beautiful. Shutting off the lake view by the R.C.C.flume sticking 8 feet high above the road level could be eliminated by raising the top of the bund from the soil obtained from the excavation. The R.C.C. flume would serve something like a parapet on the lake side.

The Superintending Engineer, Tungabhadra Valley Circle said that apart from the opinion expressed by him in his note with regard to taking the channel over the bund, he would like to add that the width of the tank bund at the left end was only 45 feet as against 150 feet in other places. So also was the sluice portion. In March 1951 there was some scour in the bund and people were afraid that the tank would breach. On examination it was found that slight leakage had appeared on the outer side of

the bund in the form of sweating, though the leakage could not be located. This indicated that the bund required strengthening.

The Chief Engineer, Major Irrigation (South) was of the view that all the three or four proposals other than the proposal to drop the channel into the Sulekere Tank had some technical defect or the other, whereas the dropping proposal was free from any of these defects. Water can get into and out of the tank without any difficulty by means of an open channel. Of course there would have to be two or three deep cuts. There was no kind of danger in this proposals. Moreover this was the proposal in the sanctioned estimate for Rs.17.75 lakhs. The only serious objection to this proposal would be the loss of command involved in dropping the channel from 20 feet to the extent of 3000 acres. Deducting about 500 acres for village reserves, the actual loss in extent was about 2500 acres. Apart from this it had no other defect and was cheaper by Rs.50 lakhs and could be executed without any construction difficulties. He said he would still press for the dropping proposals and in case this was not adopted he would prefer the alternative to take the channel over the bund by means of a trough.

The Secretary, P.W.D. desired to know whether it would be possible to examine the nature of the soil and determine the strength of the bund to take the extra load of the R.C.C. trough by putting in trial pit. Secondly it would be interesting to know what would happen to the proposed siphon or the acqueduct if the bund of the tank breached. Thirdly it was stated that in the event of a trough being constructed over the bund there might be leaks in the expansion joints. It would be necessary to examine if these leaks can be prevented by putting in steel pipes at intervals. If the difference in cost between the trough proposal and the siphon arrangement is comparatively

small then the choice would lie between adopting a conservative method of proceeding with the work and th novel way of executing the work. It was understood during the discussion that the siphon proposal could be made fool-proof whereas the alternative regarding the trough was open to risk. The question to be considered was whether from the technical standpoint a foolproff method should not be preferred to the alternative which involves certain amount of risk. Mr.Rangaiya here observed that there was no question of any alternative being fool-proof. The question is only which is the least risky one. Since there was no unanimity of opinion among the members there were two alternatives before the Committee. One was to leave it to Government to come to a decision keeping in view the opinions expressed by members. The other alternative was, this being an important technical issue, to conduct further experiments about the strength of the bund by putting in trial bores and other methods and see if the members could not come to an unanimous decision about the proposal.

The Superintending Engineer said that trial pits cannot be sunk immediately as the reservoir was full and the soil would be most. Unless trial pits are taken up to the river bed, the safety of the bund cannot be determined. Further there were some trees in the neighbourhood of the bund. The roots of the dead trees extending into the bund would decay. The decaying material would be eaten by borrowing animals which get into the bund by burrowing and making holes in the dam which may give rise to leaks.

The Chairman said that he would prefer the Committee going into the question once again after trial pits are sunk and the whole question being re-examined with a view to seeing if the committee come to an unanimous decision on this point.

It was resolved:

" THE COMMON PORTIONS OF THE WORKS RELATING TO THE SEVERAL ALTERNATIVES BEFORE THE COMMITTEE, NAMELY THE WORK ON THE MAIN CANAL UPTO THE POINT R1 IN THE PLAN AND THE MALEBENNUR BRANCH CHANNEL FROM THE POINT R2, ABOUT WHICH THERE IS UNANIMITY OF OPINION AMONG THE MEMBERS MAY BE PROCEEDED WITH.

REGARDING THE ALTERNATIVE PROPOSALS FOR CROSSING THE SHANTISAGAR VALLEY, THE COMMITTEE CONSIDERED THAT IN VIEW OF THE DIVERSITY OF OPINION AMONG THE MEMBERS, THE POSSIBILITY OF ARRIVING AT AN UNANIMOUS DECISION WITH REGARD TO THE PROPOSAL MAY BE FURTHER EXPLORED. IT WAS AGREED ~~XXXXXXXXXXXXXXXX~~ THAT TRIAL PITS MAY BE DUG ON THE BUND OF SHANTISAGAR (ADHERING AS FAR AS POSSIBLE TO THE ALIGNMENT OF THE PROPOSED R.C.C.DUCT) WITH A VIEW TO INVESTIGATING THE NATURE OF THE SOIL AND TO DETERMINE IF THE BUND IS CAPABLE OF TAKING THE PROPOSED TROUGH. THE RESULTS OF THE TRIAL BORES MAY BE PLACED BEFORE THE COMMITTEE AT ITS NEXT MEETING. THE QUESTION OF TAKING THE DUCT IN THE REAR OF THE BUND INSTEAD OF IN THE FRONT AS NOW PROPOSED BY SRI M.G.RANGAIYA MAY ALSO BE INVESTIGATED. MODIFICATIONS IN THE ESTIMATE SUGGESTED BY SHRI. GANGADHARA MAY ALSO BE LOOKED INTO. MODIFIED PLANS AND ESTIMATES IN THE LIGHT OF THE OBSERVATIONS OF THE COMMITTEE TOGETHER WITH THE RESULTS OF TRIAL BORES MAY BE CIRCULATED AMONG THE MEMBERS WELL IN ADVANCE OF THE NEXT MEETING."

(3) Note on the right and left abutment of the dam.

The Secretary of the Committee said that the Superintending Engineer had written a letter to the Chief Engineer, Major Irrigation(South)on the above subject and had sent a copy to him. When the Chief Engineer was asked whether the Superintending Engineer's note should be circulated among the members he said that

it need not be done as the Committee had already taken a final decision on the point.

The Superintending Engineer explained that at the time decision was taken by the Committee he had expressed the view that the rock met with on the left flank was soft and could not take the load of a composite dam but the Committee took a decision about the composite dam. Subsequently samples taken had proved that his apprehensions were correct and therefore he desired that the question may be gone into by the Committee again.

Shri Gangadhara said that the committee took the decision to have a front masonry wall with earth backing at a time when excavations had not been made at the flank end. Now that it has been done and no rock has been met with. The Superintending Engineer wanted the question to be re-examined and there was some force in what he was saying.

Shri Narasinga Rao was of the view that both the notes furnished by the Superintending Engineer, indicated that the soil met with was poor, and the S.T.A.C. in taking a decision had taken all the aspects into consideration. Only thing to be done now as to avoid the fissures.

The Secretary, P.W.D. expressed the view that apart from technicalities and procedure, since the object was to have a sound structure, it might be desirable even at this stage to go into the question of left abutment once again and resolve the doubts expressed by the Superintending Engineer.

It was accordingly resolved that the members might inspect the left flank once again as early as possible and come to a decision on this subject.

(4) NOTE ON THE MASONRY FOR THE FACE OF THE BHADRA DAM.

Shri. Gangadhara was of the view that this cannot be considered a minor point as opined by the Planning Commission Team as the spill way was a most vital part of the Dam structure and was an important matter. He said that to withstand the negative pressure long stones of 5 feet

Team as the spillway was a most vital part of the dam structure and was an important matter. He said that to withstand the negative pressure long stones of 5 feet used were quite necessary. He was of opinion that tapering the stones should have been avoided and that ihstead of having reinforced wide joints at extra expenditure, mere thin joints would have been preferable.

Shri Narasinga Rao also expressed the opinion that great care has been taken against negative pressure. The trouble is that stones not properly dressed with slight variations would develop negative pressures. The design is as if the stones are imprisoned in a cage that during cavitation, the stones are not disturbed. As the negative pressures develop at every stage and not only at the top, the stone should be bonded at every stage. Longer the stones the better it would be. He suggested that the note of the Chief Engineer may be sent to the Planning Commission.

(H.Channiah)
Secretary,
Standing Tehhnical Advisory
Committee.

SV.

Proceedings of the Thirty-fourth meeting of the Standing Technical Advisory Committee held in the Chambers of the Minister for Public Works at 3-30 p.m. on 21st October 1957.

Present:-

1. Shri H.K.Veeranna Gowdh, Minister for Public Works. Chairman
2. Shri N.N.Iyengar.
3. Shri M.G.Rangaiya, B.A., B.E.,
4. Shri M.Narasimhaiya, B.A., C.E.,
5. Shri B.S.Narasinga Rao, B.A., B.E.,
6. Shri M.N.Lakshmana Rao, B.A., B.E.,
7. Shri N.Neelakantappa, B.A., B.E.,
8. Shri K.S.Gangadhara, B.E.,
9. Shri V.Ganesh Aiyer, B.A., M.I.E., M.I.M.E.,
10. Shri D.K.Srinivasachar, I.A.S., Secretary to Government, P.W.D.
11. Shri J.L.D'sa, B.E., B.Sc.(Hons) A.M.I.E.E., Chief Engineer, Mysore State Electricity Board.
12. Shri T.S.Moorthy, B.E., Chief Engineer, Major Irrigation (North),
13. Shri C.R.Krishnaswamy Mudaliar, B.E., Chief Engineer, General and M.I.S.
14. Shri H.Channiah, B.E., Under Secretary to Government, P.W.D. (Secretary).

Absent:-

1. Shri H.Ananthachar, B.E., A.M.I.E.

Agenda for the meeting

(1) Confirmation of the proceedings of the 33rd meeting held on 10th July 1957.

--

The proceedings having been circulated among the members, were taken as read and confirmed.

(2) Left Flank connections to the Bhadra Dam.

The following decision taken at the preliminary meeting of the committee held on 4th August 1957 was ratified:-

" The majority of the S.T.A.C. members who inspected the spot recently are of the opinion that there is no need to alter the decision already taken for and opting the composite Dam; Shri Gangadhara however feels that a wing wall

as indicated in the Plan along with the earthen dam even though more costly, would be preferrable. Shri Narasinga Rao and majority of the members feel that the slopes of the hill are too steep to build an appropriate earthen dam."

(3) Chickhole Scheme.

The discussions and the conclusions reached at the preliminary meeting held on 25th September and subsequent additions by Sri T.S.Moorthi at the preliminary meeting of 20-10-1957 were brought to the notice of the committee by the Secretary.

The Chief Engineer, Major Irrigation (North) suggested that after meeting the requirements of the first crop and after providing for evaporation losses, water if any, available in the reservoir could be made use of for raising a second crop. He considered that this might be possible since water supply for the second crop becomes necessary only from the end of October or commencement of November when the reservoir would be full.

Shri Rangaiya and Narasinga Rao said that this aspect was considered by the committee and the members felt that the capacity of the reservoir as now designed was not enough even to meet the requirements of a single crop, unless the capacity was suitably increased or irrigation was developed in stages by adopting a suitable crop pattern.

It was resolved that the scheme as placed before them might generally be approved and the project finalised having regard to the minutes of the preliminary meeting on 25-9-1957 (vide enclosure 4), without further referring the question to this committee. The points raised by the Chief Engineer, M.I.N. in the preliminary meeting on 20-10-1957 (vide enclosure 4) may also be examined.

4. HEBBALLA PROJECT.

The following decision taken at the preliminary meeting held on 26th September 1957 (vide enclosure 4) was ratified:-

109

" The scheme as now placed before the committee for Rs.15 lakhs may be approved subject to the following conditions:-

(i) The spillage over the weir be reduced from 6 ft. to 4 ft. by suitably increasing the length of the weir;

(ii) Necessary provision in the design of the weir and the height of the bund be made for increasing in the capacity of the reservoir at a second stage for diversion of the flow from Taraka by constructing an anicut higher up across that stream; and

(iii) Necessary provision may also be made with regard to increase in the size of the vent of the irrigation sluices for developing future irrigation and also for feeding Kargala Tank.

The committee further recommended that this project be sanctioned and the work proceeded with immediately as this is going to serve as an auxiliary project for the Kabbini Project in rehabilitating the displaced persons on account of that project."

5. HAGARIBOMMANAHALLI PROJECT.

The following decision taken at the preliminary meeting held on 20th October 1957 was ratified:-

Subject to the remarks made by the members at the preliminary meeting held on 18-9-1957 (Enclosure III), the scheme as placed before the S.T.A.C. is generally approved. With regard to the waste weir, the members agreed to the suggestion that a portion of the discharge be disposed off through hood siphons, the balance through automatic shutters. The Chief Engineer, M.I.N. said that the exact proportion between the two modes of disposal would however be worked out by him and furnished to the members. This was agfeed to. The question of providing suitable protective works in the draft channel may also be examined by the Chief Engineer, M.I.N.".

6. Sagare Doddakere Scheme.

This was not discussed since the Chief Engineer, MIS., had recommended to Government that on account of the commanded

area overlapping with that of Kabbini project, this may be treated as a minor irrigation scheme. - (Enclosure II).

7. Alignment of the Bhadra Right Bank Channel (Davangere Branch) for crossing the Shantisagara Valley.

Shri Narasimhaiya said that this question was discussed at the last meeting of the S.T.A.C. and again at the preliminary meeting held on 20-10-1957. There were two distinct views held by members. One was that the channel should be taken behind the bund by means of an acqueduct or a siphon; the other was to take it by means of an R.C.C.duct over the bund. The members have not been able to arrive at an unanimous decision. The position may be recorded in that manner without further going into merits as the question had been sufficiently discussed.

The Secretary, P.W.D.said that at the previous meeting of the S.T.A.C. a decision was taken to the effect that trial pits might be sunk in the bund and the results be placed before the members with a view to knowing the nature of the soil. He desired to know if the members had discussed the question in the light of the results obtained and what the factual aspects of the test so conducted were. Sri C.R.Krishnaswamy Mudaliar, Chief Engineer, M.I.S. stated that trial pits were sunk to a depth of 20 to 25 feet and that only boulders and loose earth were found and water poured on the soil would immediately disappear. He was therefore of the view that it was not safe or desirable to construct a duct with such a foundation.

Sri M.G.Rangaiya said that it had been explained to him that the bund consisted of only boulders and loose earth. Some of the members were feeling that the bund as existing was itself weak and if additional load put on it, it would become weaker still. He considered this was not correct since the bund would become heavier with the duct over it and can stand the pressure of water much better. It would add to the stability of the bund if additional load is put on it and as already stated by him at the previous meetings, there would be no danger to the

bund. From his experience of over 50 years with/tank bund, he said nothing could happen that would endanger the safety of the bund if a duct was taken on it. The bund was a natural saddle. It had stood for centuries and would last for centuries. If the bund was leaky it would not have withstood the pressure of 50 or 60 ft. height of water. There might be boulders in the bund here and there. But there was absolutely no danger in taking the duct over it and he considered that it would not in any way endanger the safety of the bund.

Sri. Narasimhaiya said that the Chief Engineer was apprehensive about suitable foundation for an R.C.C. structure in the dam. This could be provided with a concrete bed and he was sure that the Chief Engineer himself would have executed a number of works over concrete beds. The other fear expressed was the possibility of a leak from the joints in the R.C.C. duct. He said that Mysore Engineers had done and can construct ducts without leaks and even if there should be leaks suitable arrangements could be made for draining off water leaking through the joints. He therefore considered that these factors need not deter the Department from undertaking the duct work which was simpler and could be satisfactorily executed by the officers of the Department.

Shri. Narasinga Rao stated that he had not been contending all along that the bund is not safe as it exists now but the introduction of a structure by excavating a trench on the bund of 30' x 11' was a potential danger engendering a situation favourable to the formation of leaks by flow channels from tank side and from leakage from R.C.C. structure if not both during execution and construction. The huge number of decayed roots serves as capillary tubes inducing leaks under pressure. This creates a state for breaching of the tank in a trice no matter what the width may be. Seppage and leakage in R.C.C. in bund will damage the

base in the bund proposal while R.C. in low and crossing will not do any harm. They are leaks in a water supplyline which will be only a waste. It was necessary to consider here the serious apprehensions expressed by Shri.Ramaswami Iyengar the previous Chief Engineer, M.I.S. while discussing the several alteranatives in the first meeting, when he was in favour of the dropping proposal he has said " the contour up to the left abutment of sulekere Tank runs in very difficult country along the foot of the hills as to be cover ducted practically in the water spread of sulekere tank at its approach to the left abutment of the tank. It is extremely dangerous to cut open the bund for passage of channel with such huge carrying capacity and let in water in the hill junction of the tank which would cause dangerous percolation and piping, breach the tank specially as the hill strata are fissured and interspersed with earth and the rock issteeply dipping down stream the vally". Again he stressed in another place in the same report the huge canal has to through in an R.C.C. duct the left hill abutment of sulekere tank in fissured soils, with strata dipping badly downs tream on precauriously steep hill slops which are liable to dangerous slips when deeply trenched down vertically to accommodate huge channel section, at lowlevels the canal will make the left hill abutment of the tank seep with water and induce danger piping condition and may seriously endanger its existence". The Superintending Engineer has in one of his notes expressed fears about this proposal and has concluded that the tank bund is not safe for carrying a water duct. In the face of the serious apprehensions of the previous project officers that the bund proposal induces piping conditions, endangering the bund and in the full knowledge of the causes of the breach of the tanks and with the nature of the R.C.C., being not water tight he considered that it was not wise to take the channel on the tank bund as it involves great risks and to leave the bund untouched as per decision of the Committee in 1947. A question may be posed as to what will happen if the bund breaches. If such a thing happens there will be no tank no

breaches. If such a thing happens there will be no tank no trough and we would have to construct the siphon now proposed which will take at least one year even on rush basis and the attachment of 90,000 acres beyond the sulekere crossing will have no water. Further the 45 ft. left flank of the bund was very week and the left sluice was also leaky. As against the trough proposal the siphon design is laid just below ground and is anchored at the end by two thrust blocks. This rests on piles diver 40 ft. deep over R.C.rafts of 2 ft. Even if the tank breaches water will flow over the siphon without damaging the structure. There would be no stoppage of supply to irrigation. With the knowledge of the failure of tanks in Mysore and other places he was definitely of the view that the siphon proposal was the best, economical and the safest proposal involving no risks ~~xxxxx~~. On the other hand the bund proposal while not having any of these advantages over siphon proposal was fraught with grave danger and if adopted would be tragic and delighting in needless risks. He was emphantically of the view that the siphon proposal was the best and economical and as designed it would stand undamaged in the eventuality of the beeach of the bund. The present proposal of having two tube ducts instead of one as originally proposed was very efficient and he recommended that it might be adopted.

Sri M.N.Lakshmana Rao said that the results of trial pits were emphatically unfavourable to the duct proposal. It had disclosed that the bund consisted of loose filling of debris with the boudlers and earth. So long as it was dry it would stand all right because of friction. Under the action of water when water soaks into the bund there would be danger to the bund. When an aqueous duct full of water is taken over the bund, one cannot be sure that such a duct would be water tight and if there were to be leaks it would endanger the bund and as such it was not desirable to resort to this proposal. On the other hand the proposal to take the channel in the rear of the bund had all the advantages. The bund would not be interfered with and the working conditions would be more elastic. There was also sufficient

space for stacking materials. He was therefore in favour of taking the channel in the rear of Sulekere bund.

Sri Narasimhaiya said that he had already expressed his view all in favour of the duct proposal and he saw no reason to change his view even after seeing the results of the trial pits. He would advisedly refrain from referring to the recommendation of the Planning Commission Team on this question. But since the Chairman desired to know what the team felt about it, he said that they were unanimously of the view that the channel should be taken over the bund. Even the members of the consultative Committee were of the same opinion. The question had also been examined by the C.W.P.C. and they also considered that it would be advisable to take the channel over the bund.

The Chief Engineer, Major Irrigation (North), said that that from his experience of the tanks he was definitely of the view that taking the duct over the bund of a tank was very dangerous. The question to be considered was how these bunds had been formed in olden days when there were no proper equipment for dewatering and consolidation and whether such bunds could be interfered with, without danger. The people in those days must have simply put debris and dumped bolders and earth over it. That is the only way in which some of these bunds had been formed. Merely because this particular tank bund had stood for 100 years there was no guarantee that it would stand for all times. Settlement was bound to be there. There were several pits formed on this tank bund indicating that the bund was sinking. According to the theory of soil mechanics it would take hundreds of years to settle. If the bund consisted of only earth, the problem of improving it would have been simple in as much as the bund could have been strengthened by consolidation. But there were boulders and voids. Even if a concrete bed was put in as suggested by some members the voids would still be there with the possibility of subsidence at a future date. The situation in this particular case was accentuated by the flow of water in a duct carried over the bund. The question now was one of choosing between a proposal which would be safe for all

12

times or of accepting an economical structure. He was definitely of the view that the duct proposal was not desirable.

Sri D'Sa observed that since there would be a number of joints in duct due to traffic on the road adjacent to the proposed duct, either on account of impact or even on account of sound waves there were bound to be leaks in spite of the precautions taken.

The Secretary, Public Works Department, said that there was a clear division of opinion among the members between the proposal to take the channel over the bund and the proposal to take it behind the bund. It was obvious that a decision has to be taken one way or the other. If a decision was taken that the channel should be taken behind the bund there were still two alternatives namely the siphon and aqueduct. He desired to know which of these the members would prefer in case the latter proposal was adopted.

Sri Narasimhaiya said that in case the duct proposal was not adopted he had no comments to offer about the other two alternatives.

Sri Gangadhara said that he had given his opinion in favour of the siphon when the duct proposal was not there before the Committee. In fact he had suggested the idea of the duct long back but the then Chief Engineer did not place it before the Committee. If this had been done the Committee would have taken a decision in favour of it long before the Planning Commission Team gave their opinion. The difficulties expressed by Sri Narasinga Rao in the case of the duct proposal could however be overcome as indicated by him at the previous meeting. If the duct is taken on the bund covering the view of the tank, some people may not like the idea. So far as the safety of the bund was concerned he said that before taking the duct over the bund the two sluices would have to be reconstructed as they were leaky and the gaps would have to be filled up. It might take perhaps some years before the soil settles whatever the compaction may be. Further there might be gaps or voids above the sluices section also.

The programme as now envisaged was to complete the whole project in another four or five years. If the duct proposal was adopted it might delay the completion of the project. He was therefore of the view that if the time factor and the aesthetic view/no were considerations, then the duct proposal could be adopted since it was more economical and feasible of course after taking the precautionary measures suggested by him. The siphon would cost about Rs.20 lakhs more and if adopted would be independent of the tank. Sri N.N.Iyengar, said that it may be possible to consolidate the bund by clay grouting and take the duct over the bund.

Sri Neelakantappa said that the Sulekere bund required attention on the part of Government since it was one of the oldest tanks in Mysore and had to be preserved as an ancient monument It would therefore be desirable to make the bund safe and take the duct over it. He added that a provision of Rs.5 lakhs made in the estimate for improving the bund was a provision worth its while. Further the proposal to take the duct over the bund was the cheapest as against the siphon proposal which would cost Rs.20 lakhs more. From the point of view of economy, working facility and also from the point of view of safety he considered there was absolutely no trouble intaking the channel over the bund and recommended that this might be adopted.

The Secretary of the Committee read the note (Enclosure XX) given by Sri H.Ananthachar (who was not present for this meeting) expressing his opinion on the subject.

No decision could however be taken by the Committee.

(7) Review of the Programme for Bhadra Reservoir Works.

It was observed by Sri Narasimhaiya that according to the longitudinal section given by the department, the height of the dam would reach plus 98 by 58-59. He suggested this being raised by a few feet so that by June 1958 water may be forced in the R.B.Channel. He further suggested that the Committee might pass a resolution in respect of the enhanced grants that are required during the years 58-59, 59-60 and 60-61 with a view to completing the project by the end of 60-61.

(12)

The revised programme was approved with the observation that increased grants to the extent of Rs.4 crores be provided in each of the years 58-59, 59-60 and 60-61 so that the project may be completed in all respects by the end of 1961.

(8) The programme of Tunga Anicut ~~are~~ as placed before the Committee was also approved.

(H.CHANNIAH)
Secretary
Standing Technical Advisory Committee.

KSR

M. G. S. App. F. G. 3]

MYSORE GOVERNMENT

SECRETARIAT.

(*Continuation sheet draft form*).

PWD 14 BRPS)

No. 1-18/1-58 17

Sub:- Alignment of the Right Bank channel for Cooking the Shankisegara Valley B.R.P.

To

The CE (D) Bangalore

Sir,

Ref:- Your D.O. No. 230 dt. 5-12-57)

With reference to the Communication cited, I am directed to invite reference to Govt's letter No. dt. 29-11-57 regarding the above subject and to state that the question was left to the decision of the CE (D),

4/F

for Secretary to Government

25/12/57

26/12/57

Shri N.V. Gadgil

Phone No:46762
PLANNING COMMISSION
NEW DELHI

December 24, 1957.

My dear Shree Gowdh

Thank you for your letter dated the 13th December, 1957. I am grateful to you for the trouble taken to prepare a note on the question which accompanies it. It seems that there is a difference of opinion between the State Government and the Team in this matter and in terms of the Directive given to me by the Committee on Plan Projects, this difference of opinion has to be reported for a final decision to them with points for and against it. I am having a note prepared on this subject, which I shall send to the State Government. I am also requesting the Chairman, Committee on Plan Projects, to hold a meeting of the Committee (Irrigation Sector) as early as possible in order to take a final decision on this issue. I would not have pressed for it but for the fact that the Team is still of the opinion that having regard to the considerations of the stability of the structure, the solution suggested by it is the economical and feasible. If you want further discussion on this subject, I shall be glad to have them with you at our mutual convenience.

Yours

(N.V.Gadgil)

Shri H.K. Veeranna Gowdh,
Minister for Public Works,
Government of Mysore,
BANGALORE.

131

MPW-1228 Dt. 10-1-58.

My Dear Shri.Gadgil,

Kindly refer to your letter of 24th December 1957 about the suggestion made by the COPP Team ~~for Bhadra Project~~ in regard to the crossing of Shantisagar Valley in Bhadra Project. While I was at Delhi from 29th to 31st December 57, I made enquiries as to whether you were at Delhi so that we could have a discussion on the subject. Unfortunately, by the time you were expected there, I had to leave Delhi.

Issued

2. You have referred in your letter to a note which is proposed to be sent by the Team to the State Government. I have not so far been in receipt of the note. I am sure you will agree with me that we have to take all possible steps for the speedy completion of the Project, and as ~~it is with a view to seeing that all the technical~~ problems were solved as early as possible that we left this particular question to the Chief Engineer in charge to decide. You would perhaps agree also that keeping this question open any lon might militate against quick progress on the work, particularly when the working season is o and this is the only time when substantial pro can be secured.

with best regards,

Yours sincerely,

10/1

(MINISTER FOR P. W.)

133

10th Jan. 58.

MPW. 1228

My dear Shri Gadgil,

Kindly refer to your letter of 24th December 1957 about the suggestion made by the COPP Team in regard to the crossing of Shantisagar Valley in Bhadra Project. While I was at Delhi from the 29th to the 31st December 1957, I made enquiries as to whether you were at Delhi so that we could have a discussion on the subject. Unfortunately, by the time you were expected there, I had to leave Delhi.

2. You have referred in your letter to a note which is proposed to be sent by the Team to the State Government. I have not so far been in receipt of the note. I am sure you will agree with me that we have to take all possible steps for the speedy completion of the Project, and that keeping this question open any longer might militate against quick progress on the work, particularly when the working season is on and this is the only time when substantial progress can be secured.

With best regards,

Yours sincerely,

Sd) H.K.U.

Shri N.V.Gadgil,
Planning Commission,
New Delhi.

135-

Immediate.

D.O.No.COPP(4)/38/57/1465
PLANNING COMMISSION
NEW DELHI

February 4, 1958.

My dear Shri Gowdha

In continuation of my letter dated 24th December, 1957, I enclose herewith a note prepared by the Team regarding the allignment of Bhadra Right Bank Channel where it crosses the Sulekere Valley. While preparing this note, the Team has taken into account all the technical data furnished by the Deputy Secretary, P.W.D. vide his letter D.O.No.P.W.D.68/BRP/57 dated 18th December, 1957.

(A)

2. It is evident from the note that the Team is still of the opinion that having regard to the stability of the structure, the solution suggested by it is the most economical and feasible one.

With kind regards,

Yours

(N.V.Gadgil)

Shri Veeranna Gowdh,
Minister for Public Works,
Mysore Government,
BANGALORE.

157

N.V.Gadgil

No.COPP(4)/38/469
Planning Commission,
New Delhi.
Committee on Plan Projects,
Dated 4th February, 1958.

1217
11/2/58

+ 129cF

My Dear Shri Veeranna Gowdh,

In continuation of my letter dated 24th December, 1957, I enclose herewith a note prepared by the Team regarding the allignment of Bhadra Right Bank Channel where it crosses the Sulekere Valley. While preparing this note, the Team has taken into account all the technical data furnished by the Deputy Secretary, P.W.D. vide his letter D.O.No.P.W.D.68/BRP/57 dated 18th December 1957.

2. It is evident from the note that the Team is still of the opinion that having regard to the stability of the structure, the solution suggested by it is the most economical and feasible one.

With kind regards,

Yours sincerely

Sd/-

(N.V.Gadgil)

Shri Veeranna Gowdh,
Minister for Public Works,
Mysore Government,
Bangalore.

No.COPP(4)/38/57/191
Irrigation & Power Team.

Copy forwarded with compliments to the Secretary to the Government of Mysore, Public Works Department Vidhan Soudha, Bangalore for information.

(D.S.Borker)
5-2-58.

Secretary,
Public Works Department,
Government of Mysore,
Vidhan Soudha,
Bangalore.

Enc: 2 copies of the note.

for perusal - It will be recalled that we left a matter to be decided by you Ch. Min decision taken by him is at variance with Planning Commission Team's recommendation - we may send you 25 copies of this note for very early Comment.

for Today

D. K. SRI...

Irrigation and Power Team

Note on the alternative alignment of the Right Bank Channel, Section III - the Malebennur and Davangere Branches (Lakkavali Project)

In this connection a number of alternatives were under consideration by the Project authorities and the Standing Technical Advisory Committee of the Mysore State. These have been indicated in app. 3 of the Report of the Irrigation and Power Team on the Project.

For ready reference they are noted below:-

Alternatives	Estimated cost of the alternatives as furnished to Shri G.N.Pandit, Member, I & P Team.
(i) The Malebennur Branch channel on a falling contour along D R_1R_2. The Davangere Branch Channel on a falling contour along DFJVGWH (southern and eastern peripheries of the tank) (vide Index Plan in the Report).	167 lakhs.
(ii) The Right Bank Channel on a falling contour along DR1 R2. The Malebennur Branch Channel to start from R2. The Davangere Branch Channel on falling contour along R2 PO (skirting a hill slope), crossing the Sulekere Valley below the Sulekere Dam along ON by means of an aqueduct or a canal syphon, continuing along the near side of the hill situated on the right flank of the Sulekere dam, crossing the waste weir channel of the tank over an aqueduct and finally joining the alignment in proposal (i) at H.	127 lakhs.

(iii)	The Right Bank Channel to be dropped into the tank as shown by DK in the plan. The Malebennur Branch Channel to take off from the tank along XR1 R2. The Davangere Branch channel to take off from the tank along YH.	94 lakhs - Additional cost for extending the canal to gain command lost in dropping the canal to lower levels.
(iv)	The Right Bank Channel as in proposal II. The Malebennur Branch Channel as in proposal II. The Davangere Branch Channel on a falling contour along R1 LM, crossing over the bund in a R.C.C. trough and continuing beyond the bund along the alignment in proposal II. (Recommended by the Team).	113.5 lakhs.

2. The team for Irrigation and Power Projects considered the four alternatives and made suggestions for the adoption of the alternative as at (iv) above. This proposal was accepted by the Consultative Committee constituted for Irrigation and Power sector.

The Committee is headed by Shri N.V.Gadgil, the Leader of the Irrigation and Power Team and consists of the following members:-

i) Dr. A.N. Khosla,
Vice Chancellor,
Roorkee University.

ii) Shri M.S.Thirumale Iyengar, I.S.E.
Chief Engineer, Hirakud Project.

iii) Shri N.N. Iyengar,
Electrical Advisor,
Ministry of Iron and Steel.

iv) Shri R.K. Gupta, I.S.E.
General Manager,
National Construction Corporation.

3. The suggestion made by the Team was placed before the Standing Technical Advisory Committee of the Mysore Govt. during their 33rd meeting (21-10-57)

in accordance with their procedure in this respect. Certain objections were raised by some of the members of the S.T.A.C. and these are listed in Appendix I. It was suggested at that meeting that the trial pits should be taken along the proposed alignment of the trough on the bund to find out the nature of the bund structure.

4. After the trial pits had been taken and the results were known, a further meeting of the S.T.A.C. was held on the 21st October, 1957 (34th meeting). The following specific objections were raised:-

i) The bund material which was found to consist of bouldery stuff and which is very porous would not be able to support the trough.

ii) Leakage through the trough would be inevitable and would cause subsidence and damage to the bund and trough.

5. The Team is of the view that these objections do not raise issue of an insuperable character.

As regards (i), the bund material consisting of bouldery stuff has a much greater bearing capacity than clayey materials ordinarily used for formation of such bunds, and it would easily bear the load of the trough which is hardly half a ton per sq. foot. The design of the foundation for the trough can be made such that there need be no apprehension of the foundation not being able to support the duct and yielding.

The bund is centuries old and has settled to its final limits under the action of its own load aided by traffic thereon. There can be no

... 4

further settlement.

As regards (ii), the R.C. duct could be designed, and constructed efficiently enough, by providing proper joints and water proof compound to make it water-tight.

Leakage through the duct if at all, could be taken care of by the insertion of adequate pipe drains below the duct leading the water away from the dam.

6. The results of these trial pits do not thus present any difficulties whatsoever. On the other hand this alternative is the most straightforward and easy solution. The Central Water and Power Commission who are of this opinion, if approached, are ready to provide designs and specifications for this work.

7. The overwhelming opinion in the STAC, the Consultative Committee, the Team of the COPP and that of the CWPC is in favour of the present view of the Team.

8. The reasons why the Chief Engineer has taken a decision to adopt provision of a syphon in the rear of the bund are not on record.

9. It is obvious from the foundation drawings of the proposed syphon circulated by the Secretary (copy attached as appendix III), S.T.A.C. near about 21-10-57, that no rock has been struck at any point in the bed of the valley even though the bores have gone to a depth of 40 to 50 ft. However the piling is proposed to be driven only to a depth of 40'. This is insufficient and unsafe. Similarly from the same drawing, it is observed that the piling is provided only roughly in a third of the total length of the syphon. In

regard to the rest of the length no details are available of the nature of foundation material. These piles would be necessary for the syphon also.

The difference in cost between the two alternatives is of the order of Rs. 20 lakhs as was opined by some Member of the S.T.A.C.

10. In view of the above circumstances it is strongly recommended that the Committee on Plan Projects may persuade Government of Mysore to adopt the Team's proposal. It is also necessary that pending a final decision in the matter, the work of the syphon and excavation of the Davangere Branch Channel should not be proceeded with to avoid infructuous expenditure.

Appendix I

List of objections to Team's proposal with comments thereon.

S.No.	Objection	Comments
1.	In 1947, when the S.T.A.C. first met to discuss this problem, the Committee did not propose to take the alignment over the bund, but they favoured only two alternatives i.e. taking the channel round about the tank in contour, or crossing the valley, lower down the tank bund- B.S.Narasinga Rao.	This fact in itself does not preclude the other possibilities, and hence does not constitute any disqualification for the Team's proposal. Shri. M.G.Rangiah has clarified the background against which they could not consider the possibility of taking the channel over the bund, as the bed level of the channel then contemplated was much lower than what it is now.
2.	The Chief Engineer, Major Irrign. (South) did not place this proposal to S.T.A.C., before he placed it before the Team - B.S.Narasinga Rao.	It is possible that his mind was preoccupied with the existing proposals only.
3.	The statement that the Team's proposal has found favour with practically all the S.T.A.C.members is incorrect.- B.S.Narasinga Rao.	The general validity of this statement is obvious from the minutes of the S.T.A.C.meeting held on 10-7-57, where, except Shri. B.S.Narasinga Rao and Shri. M.N.Laxman Rao, all others have no objection to the Team's proposals and they do not favour any other alternative except the one favoured by the Team. Thus, the Team shares the view held by vast majority of S.T.A.C. members.
4.	Trough is a novel idea in India and Mysore in particular- B.S.Narasinga Rao.	There is nothing novel in the idea. If a trough can span piers of acqueducts, it can surely rest in peace on firm ground. Breaches referred to are obviously of not concrete troughs but channels taken in pure bank.
5.	Construction dangers are implied as the trough will have to be laid in a trench of 1400' x 21' x 11' dug on the bund, and rains may completely damage the trench and bund etc.etc.-B.S.Narasinga Rao	These dangers are absolutely exaggerated and imaginery, for, firstly there is no compulsion to dig 1400' length at once since the trough has construction and expansion joints at intervals. Secondly, the trench to be dug into the bank is not 11' as made out but only about 6' in the free board portion which is 18' deep. Thirdly, no excavation need be started unless all the preconstruction planning has been achieved and materials, men and equipment are all at hand.

6.	Elaborate arrangements are needed to make the (bund) structure leak-proof, and preventing the roots of big trees on the bund from becoming capillary tubes is not fool-proof-- B.S.Narasinga Rao	As the bund is known to impound the run off from the catchment without loss of storage by way of percolation through the bund, the structure of bund is quite water-proof and does not need water proofing treatment. Moreover, as far as the trough is concerned,all that is needed of the bund is to provide the necessary bearing resistance only, which is independent of the porosity or otherwise of the bund. Thus, the objection sought is absolutely imsplaced.
7.	Difficulty of procurement of steel, and the necessity to do the work round the clock- -- B.S.Narasinga Rao.	These difficulties are in no way lesser but actually much more in the alternative put forward by Shri. B.S.Narasinga Rao viz., the syphon which is an R.C.C.structure under pressure. All these difficulties can be solved.
8.	Restriction of space for collecting material- B.S.Narasinga Rao.	This problem can be solved. There is a huge width of embankment in the middle of the bank which can be eminently utilised for this purpose. Thus, the objection is not valid.
9.	Diversion of traffic on the Davangere-Channagiri Road would offer a problem, as there is no possibility of diversion- B.S.Narasinga Rao.	There is ample space for this and the traffic can be diverted on a defined width.
10.	The trough, which would project above (the road level) would offend the aesthetics of the lake by coming across the view of the lake- B.S.Narasinga Rao.	The road can be kept on the water side and the trough on the rear side of the bund as already proposed by other S.T.A.C.members and the aesthetic aspect preserved.
11.	The channel if carried through a trough on the bund has potentialities of endangering the bund- B.S.Narasinga Rao.	There is no such potentialities as the extra load ~~id~~ is negligible and the bund is too wide to give room for such apprehensions.
12.	It would not be practicable to have a leak-proof duct as there would be a number of joints as a result of expansion and contraction, there are bound to be leaks- M.N. Laxman Rao	Even though it is not unlikely that the trough may develop leaks, such leakage need not be dreaded, as, firstly, the quantity of such leakage water is of very small magnitude and secondly it can be intercepted by filters and pipe drains.
13.	Even though the load of channel in the trough is small, due to unequal settlement on account of capillary action etc., there may be danger to the bund- M.N.Laxman Rao	As the bund is too old, it has settled to the limits, and such petty loads cannot result in settlements.Even if settlements were to take place, earthen bunds do not undergo any dangers thereby.

B. Advantages claimed by Shri B.S.Narasinga Rao in favour of the Syphon proposal with comments thereon.

1. As the case is not one of crossing a "Live Valley", but a"dry deep low bit of original Valley", there are no probabilities of future scours necessitating foundations to be designed against unprecedented floods. --B.S.N.Rao.	It is not a case of crossing " a dry bit of valley", as made out. Actually, it is the old river bed full of loose silts and sands, under saturation conditions, being in the rear of the reservoir. It is intriguing to know how one who could not trust a dry and age-old bund to bear a trough, is ready to do so in the case of this loose, saturated silty stuff. Moreover, if at all doubts are expressed at the safety of the bund, how can this so-called 'dry valley' without the dangers of scouring floods, continue to be so, in the event of the failure of the bund, as strongly apprehended by Shri B.S.N.Rao? Thus, this argument contradicts Shri B.S.N.Rao's arguments against the proposals for trough, and Mr.Rao cannot advance both these arguments at the same time.
2. The construction of the syphon is straight forward work without any difficulties, which can therefore be constructed with ease- B.S.N.Rao.	In view of the saturated silts and sands extending for more than 40' to 50' as no rock is reported to have been reached to these depths, the founding of the syphon is by no means easy. Even if costly piles are to be used, they have to be driven to firm strata, which is not reported to have been met upto these long depths. Thus, the foundation problem is neither easy nor cheap, as in the case of the trough placed on the bund. Moreover, a syphon under a pressure of 80' head of water is much more complicated than an open duct. Thus, the advantages claimed are non-existent, actually there being disadvantages, as shown above.
3. The syphon will leave the Sulekere bund (with uncertain factors) undisturbed -B.S.N.Rao.	As apprehended so vehemently by Shri B.S.N.Rao, if the Sulekere tank were to breach, the safety of the syphon resting on piles cannot be guaranteed, since the waters of the reservoir are bound to disturb the piles. Therefore, leaving the Sulekere tank undisturbed is not going to remove the element of danger apprehended in the case of trough. Thus the advantage claimed is fallicious in view of his own views about the bund. However, as the bund is dependable, there is no need to go into this aspect in either of the proposals.

APPENDIX II

Dr. K.L.Rao, M.Sc.Ph.D.M.I.C.E.,
Member (Designs and Research)

D.O.No.10/10/57-C.D.O.
Central Water and Power Commission,
New Delhi, 13-1-1958

My dear Borker,

Shri. Narasimhaiya discussed with me a few days back the question of taking the Davangire branch of the Right Bank Canal of Lakkavali Project. He sent me a copy of his letter to Shri. Gadgil, Leader, Irrigation and Power Team. I am in full agreement with this letter. As stated earlier, I am definitely of the opinion that the canal should be taken overthe bund and not behind it across the valley either by a syphon or an aqueduct. Suitable design can be made to ensure the safety of the bund even assuming unfavourable conditions. The designs for the structure can be prepared in the C.W.P.C.if the State Government so desires. Before actually these are prepared, I would inspect the site to settle some details.

Your sincerely,

Sd/- K.L.Rao

Shri. D.S.Borker,
Secretary, I.& P. Team,
Committee on Plan Projects,
Multi-storeyed Building, 5th floor,
Queen Victoria Road,New Delhi.

M.Narasinhaiya

Member,
Irrigation & Power Team,
Committee on Plan Projects,
Planning Commission,
New Delhi.

Dear Shri Gadgil,

I wish to inform you that I had a discussion again with Dr.K.L.Rao in detail, in regard to the question of Bhadra Right Canal, being taken on the bund instead of behind the bund by means of an aqueduct or syphon. He had no doubts, whatever, in his mind that the canal should be taken on the bund and the proposal of the Team to take it accordingly was quite in order. He also mentioned that he would arrange for the necessary designs and specifications to be prepared to ensure the safety of the bund against any leaks in the duct which would be very negligible or the apprehended unsatisfactory nature of the foundation for the duct viz. bouldery soil as found in the trial pits.

I have alsl discussed this question with some engineers who have got a good experience of design and the execution of works of this nature and they hold the same view.

With high regards,

I remain,

Yours sincerely,

Sd/- M.Narasinhaiya.

Shri N.V.Gadgil,
Leader,
I & P Team.

M. G. S. App. F. G. 3]

MYSORE GOVERNMENT

SECRETARIAT.

(*Continuation sheet draft form*).

PWB 14 BRPS)

Sub: Alignment of the Right Channel for crossing Shantisagar Valley : B

~~Memo~~ In Continuation of Govt letter of even no dt 18.1.58 I am advised to forward herewith a copy of ~~the~~ D.O. letter no Copp (4) /38/46 dt 4-2-58, addressed to the Minister for Irrigation by Sri Gadgil leader of the Team of Planning Commission (G.o.I), along with a set of copies of the note referred to therein, regarding the above Subject and to request ~~that~~ your Comments in the matter ~~may be furnished in the matter~~ urgently. The matter may please be treated on the top priority basis.

Yours faithfully,
S.
for
Secretary to Government
PWD

Pl type a copy of letter at page (157 cf)

157 (only portion addressed to Minister)

WD 0258—GPB—PZS-1,20,000—1-7-55.

11/2/58

11/2/58

K.B.Murarappa, B.E.,
Under Secretary to Government,
Public Works Department..

Mysore Govt. Secretariat,
Vidhanasoudha,
Bangalore, dated 11 Feb.58.

D.O.No.PWD 14 BRP 57

Dear Sir,

Sub: Alignment of the Right Bank Channel for crossing the Shantisagar Valley, B.R.P.

=====

In continuation of Government letter of even No. dated 18-1-58, I am desired to forward herewith a copy of the D.O.letter No.Copp(4)/38/469 dated 4-2-58, addressed to the Minister for Public Works by Sri Gadgil leader of the Team, Committee on Plan Projects, Planning Commission, Government of India, along with a set of copies of the Note referred to therein, regarding the above subject, and to request you kindly to forward your comments in the matter urgently. The matter may please be treated on top-priority basis.

Yours sincerely,

o/c

11/2/58

11/2/58

To

Shri C.R.Krishnaswamy Mudaliar, B.E.,
Chief Engineer, Major Irrgn.(South),
Bangalore.

case and work asked to be proceeded with to ensure adherence to the time-schedule already chalked out. Work to the extent of nearly Rs. 1 lakh has already been done, mainly on excavation of the channel for the alignment behind the bund. It is not desirable to make any change in the decision already taken. I would consider it better to leave matters as they are and persevere with the alignment behind the bund.

Further, the cost of all the alternatives, viz., Aqueduct, Siphon, and Duct, has been worked out and on comparison it is found to be practically the same for each proposal. It is proposed, on examination, to adopt the aqueduct, for the construction of which local materials could be utilised and the construction completed in as short a time as possible. We (Chief Engineer and the local officers) assure that this will be economical and safe and the work got done as quickly as possible.

Yours faithfully,

C.R.Krishnaswamy

(C.R.Krishnaswamy Mudaliar)
Chief Engineer, MIS.

20/-2/58

B.S. Srikantiah, IAS,
Dy.Secy. to Govt.PWD

Dt. 18th Dec. 1957.

DO No.PWD 68 BRP 57

Dear Shri.Borker,

Please refer to your D.O.letterNo.Copp/I & P/82/57 of 12th December 1957, regarding the Report of the Irrigation and Power Team for Lakkavalli.

I am desired to state that the State Government is in general agreement with the recommendations made by the Team and a statement of the points on which agreement has been reached (except item No.5.3 & 6.11) was sent to the Leader of the Team with letter No.MPW 1068 dated 5th December 1957.

Item No.5.3, pertains to the suggestion made by the Team to take the Davanagere Branch of the Channel over the Shantisagar Bund in R.C.C. trough. As already indicated in the statement, the decision in regard to the alignment was left to the Chief Engineer, incharge of the Project. I am to state, that the Chief Engineer has since reported that after taking into considera tions all the aspects of the case and in the light of his personel experience and knowledge, he has decided to adopt the alternative of taking channel behind the bund, instead of, over the Bund. A detailed note indicating the present position and the reasons for the decision taken by the Chief Engineer, in the matter, has also been sent to the Leader of the Team by the Minister for Public Works in his letter No.MPW 1102 dated 13th December 1957. A copy of it is enclosed.

As regards item No.6.11, I am to mention here that the levy of water rates will be governed by the provisions of the new law regarding Betterment Contribution and Water rates and the rules thereunder, as already stated.

With regards,

Yours sincerely,

To

Shri.D.S.Borker,
Secretary, Consultative Committee,
Irrigation and Power Projects & Team,
Multi-storied Building, (5th Floor H Wing),
Queen Victoria Road, NEW DELHI-2.

'Copy'

An extract of the Bhadra Reservoir Special Committee which was continued on 9-3-1958 when the following members were present.

****

1. The Minister for Public Works.
2. The Secretary to Government, Planning Department.
3. The Secretary to Government, P.W.D.
4. The Chief Engineer, Mysore Electricity Board.
5. The Chief Engineer, H.E.C.P.
6. Sri M.Narasimhiah, B.A., C.E., M.I.E.,
7. The Chief Engineer, Major Irrigation (South)

Sub: Alignment of the Bhadra Right Bank Channel across the Shantisagar Valley.

-o-o-o-

The Committee took note of the correspondence that had passed between the State Government and the Irrigation & Power Team of the Committee on Plan Projects on the one hand, and between the State Government and the Chief Engineer, Major Irrigation South on the other, and also of the latest report of the latter. The Committee considered that the decision taken by the Chief Engineer in the matter may be allowed to stand in the circumstances reported by him and that he may be requested to take a decision very early about adopting one of the two alternatives for the alignment behind the bund, viz., an aqueduct and a syphon, in consultation with the S.T.A.C. if necessary. It was agreed that a Note giving the reasons for the adoption by the Chief Engineer of the alignment behind the bund may be sent to the Irrigation & Power Team of Committee on Plan Projects for their information, indicating clearly the present position.

Shri M.Narasimhaiya, one of the members of the Committee, stated however, that he was unable to subscribe to the decision of the Committee on this subject.

MYSORE GOVERNMENT SECRETARIAT No 2201 PWD 1 BRC 58 MAR 1958 PUBLIC WORKS MAJOR IRRIGATION BRANCH

-1- 13-3-1958

Copy of the above is forwarded to the Under Secretary, Major Irrigation Section with a request to see that a note as desired in the Committee's Proceedings is got up and sent to the Irrigation & Power Team. As a meeting of the S.T.A.C. is being shortly convened, it may kindly be ascertained from the Chief Engineer, Major Irrigation (South) over phone, if he is placing the subjedt relating to the adoption of one of the two alternatives for the alignment behind the bund and intimate the same to me urgently.

Sd/-

Secretary, Bhadra Reservoir Special Committee.

Sd/-
for immediate action on (A) above

P. 135 C.F.

P. 53 C.F.

My Dear Shri Gadgil,

Kindly refer to your letter of 4th Feb. 1958 about the note prepared by the team regarding the alignment of Bhadra Right Bank Channel where it crosses the Sulekere Valley. I have already explained to you in my previous letter of 13th Decr. 1957 ~~the circumstances that were led~~ as to why it was considered to be advisable to leave the decision to the Chief Engineer incharge of the project. However, the note received ~~by~~ from you was referred to the Chief Engineer for his comments. He considers that the proposal of ~~the~~ crossing the valley behind the bund by means of siphon or an aqueduct to be the one best suited for the place for the following rasons:-

~~He is of the opinion that~~ The bund of Shantisagar tank should not be interfered with in any way. The trial pits excavated show that the bund is made of debris and loose soil for more than 20 ft. depth. It is probable that there is an old well-settled consolidated bund at lower levels and the raising of the bund done subsequently is by dumping loose excavated stuff.

The question that exercises the mind is not the difficulties likely to be met with in constructing a leak-proof R.C.C. Duct on the Shanthisagara Bund. Nor is any doubt felt about the capacity

of our Engineers to design and execute such a work.

The fear ~~point at issue~~ is that the bund, though an old and well-settled one, will develop a leak at some future date, as it has happened in other tanks in the State, which may lead to the settlement and scour of the material below the duct. Such a phenomenon will not always be visible at the surface and this may lead to a sudden undermining of the foundations of the duct. This may lead to a total failure of the duct ~~and~~ resulting ~~consequently~~ in water supply to lands being totally cut off.

The Irrgn. sluices of the tank are badly leaking. They are probably the old barrel type of brick masonry. The R.C.C. Duct cannot be taken up unless these sluices are opened out and reconstructed. They are located at 45 ft. below the top of the bund. To construct them, a length of at least 100 ft. of bund on both flanks will have to be cut open for a depth of 50 ft. or more. This length of 100 ft. will have to be filled up after the repairs. The duct will thus be crossing a freshly made up strip of 100 ft. at two places along the bund. These two strips will practically cover a major portion of the length of this short bund. These two strips will certainly form the weakest link in the Duct as these portions are subject to differential settlement as compared to the rest of the bund which remains undisturbed.

This work of reconstruction of the sluices ~~has~~ will have ~~of~~ necessarily to precede the construction of the duct. This work involves at least two working seasons. The tank will have to be depleted to a fairly low

CONFIDENTIAL:

Office of
The Chief Engineer, Major Irrigation-
South,
Bangalore, dated Febry. 21, 1958.
(Camp - Mysore)

No.P.C.258

To

The Secretary to Government,
Public Works Department,
Bangalore.

MYSORE GOVT. NO. 1639 25 FEB 1958 PUBLIC WORKS MAJOR IRRIGATION BRANCH

Sir,

Re: alignment of the Right Bank Channel for crossing the Shanthisagara Valley - Bhadra Reservoir Project -

Adverting to your D.O. No.PWD 14 BRP 57 dated 11-2-1958, on the above subject, I write to invite your kind reference to correspondence resting with my D.O. letter No.P.C.230 dated 5th December 1957 stating that the question of the alignment of the Right Bank Channel for crossing the Shanthisagara Valley has been examined in all its aspects and I consider that the proposal of crossing the valley behind the bund by means of a siphon or an aqueduct to be the one best suited for the place.

I have also informed you in the same letter that I am issuing instructions to the Superintending Engineer, Tunnel Circle, to proceed with the work on the Davangere Branch Channel on this basis. Work is now progressing on these lines and channel excavation proceeding briskly.

I am definitely of the opinion that the bund of Shanthisagara Tank should not be interfered with in any way. The trial pits excavated show that the bund is made up of debris and loose soil for more than 20 ft. depth. It is probable that there is an old well-settled consolidated bund at lower levels and the raising of the bund done subsequently is by dumping loose excavated stuff.

The question that exercises our mind is not the difficulties likely to be met with in constructing a leak-proof R.C.C. Duct on the Shanthisagara Bund. Nor is any doubt felt about the capacity of our Engineers to design and execute such a work.

The point at issue is that the bund, though an old and well-settled one, will develop a leak at some future date, as it has happened in other tanks in the State, which may lead to the settlement and scour of the material below the duct. Such a phenomenon will not always be visible at the surface and this may lead to a sudden undermining of the foundations of the duct. This may lead to a total failure of the duct and consequently water supply to lands beyond totally cut off.

The irrigation sluices of the tank are badly leaking.

They are probably the old barrel type of brick masonry. The R.C.C. Duct cannot be taken up unless these sluices are opened out and reconstructed. They are located at 45 ft. below the top of the bund. To construct them, a length of at least 100 ft. of bund on both flanks will have to be cut open for a depth of 50 ft. or more. This length of 100 ft. will have to be filled up after the repairs. The duct will thus be crossing a freshly made up strip of 100 ft. at two places along the bund. These two strips will practically cover a major portion of the length of this short bund. These two strips will certainly form the weakest link in the Duct as these portions are subject to differential settlement as compared to the rest of the bund which remains undisturbed.

This work of reconstruction of the sluices has of necessity to precede the construction of the duct. This work involves at least two working seasons. The tank will have to be depleted to a fairly low level to enable the work being taken up. This will in turn affect adversely irrigation under the tank. It will also interrupt road traffic across the bund, to avoid which costly diversions have to be provided.

The adoption of an Aqueduct or Siphon behind the bund in the valley is not subject to these adverse conditions and there will be no intangibles as in the case of the other proposal. The bund remains undisturbed. The repairs to the sluices need not precede the construction of the aqueduct. These repairs can be taken up at any time independently of the latter. Irrigation below the bund will be least disturbed by this alternative.

The objection that a breach of the bund may wash away the aqueduct can be overcome by suitably designing the structure and providing long spans between supports and having sufficient water-way for maximum expected flows. The foundations will be taken down to hard bed and there should be no anxiety about them even in case of a breach of the tank.

The other Chief Engineers of Mysore State are also strongly of the view that the bund should not be interfered with and the channel should be taken across the valley at the rear of the bund. All the local officers, including the two Superintending Engineers of the Project, are also of the same view. I am in full agreement with them.

As the final decision was left to be taken by me as per your D.O. letter No.PWD 14 BRP 57 dated 27th November 1957, a decision has been taken after considering all aspects of the

p. 4 cF.

SECRETARY TO GOVERNMENT
19/11/57
M.E.S.

Bangalore
18.11.57. Bhadra
Davangere Branch Bypass
Shanti Sagar Valley Crossing

Dear Shri Srinivasachar,

I took an opportunity to discuss
Part was in the two alternative alignments again with
we corrected Sri Ramanand Executive Engineer and obtained
for from him the full details of provisions made
"19" in the Estimate. As this subject matter was
19/11/57 not on the Agenda there was no occasion to
bring me to explain one or two points that
emerged from my examination at the meeting.

(1) In the alignment of Syphon alignment
19.11.57 an additional provision of Rs 2½ lakhs is needed
to provide masonry duct along the Steep Slope of the
hill for a length of 5 graves. The Executive Engineer
feels that this is absolutely essential & have
his personal authority to mention this.

(11) The provision of Rs 5/- lakhs made for
'Strengthening the Bund' for the duct over the
Bund estimate is for any work that may be
needed in view of the soil found in the Bund
as found from the trial pits.

This provision is too much about a lakh of rupees should be made to appear measure that has to be taken to have a true basis to the R.C. Act.

Thus even like the estimates that are now placed before us the difference would be of the order of Rs 6½ lakhs in favour of the R.C. Act.

With high regards,

Yours sincerely,

M. Visvesvaraya

193

level to enable the work being taken up. This will in turn ~~affect~~ adversely affect irrigation under the tank. It will also interrupt road traffic ~~across~~ on the bund, to avoid which costly diversions have to be provided.

The adoption of an Aqueduct or Siphon behind the bund in the valley is not subject to these adverse conditions and there will be no intangibles as in the case of the other proposal. The bund remains undisturbed. The repairs to the sluices need not precede the construction of the aqueduct. These repairs can be taken up at any time independently of the latter. Irrigation below the bund will be least disturbed by this alternative.

The objection that a breach of the bund may wash away the aqueduct can be overcome by suitably desigining the structure and providing long spans between supports and having sufficient water-way for maximum expected flows. The foundations will be taken down to hard bed and there should be no anxiety about them even in case of a breach of the tank.]

2 The C.E. ~~He~~ further states that decision has been taken by him after considering all aspects of the case and has ~~work~~ asked the work to be proceeded with to ensure adherence to time schedule already ~~xxxx~~ chalked out. Work to the extent of nearly Rs.1 lakh has already been done mainly on the excavation of the channel for the alignment behind the bund. ~~Hence~~ He ~~would~~ considers

X. He maintains that

X. the other Chf. Engr. of this State were also strongly of the view that the bund should not be interfered with and the channel should be taken across the valley at the rear of the bund.

it better to leave matters as they are and carry on ~~persevere with~~ the alignment behind the bund. It is also stated that the cost of all the alternatives viz. aqueduct, Siphon, and Duct has been worked out and on comparision it is found to be practically the same for each proposal.

3 The matter was again discussed at the Bhadra Reservoir Spl.Committee held on 9-3-1958 during which the ~~1958 wherein the~~ Committee took ~~the~~ note of the correspondence that had passed between the State Govt. and the Irrgn. Power Team of the Committee on Plan Projects on the one hand and between the State Govt. and the Chief Engineer MIS on the other and also the views expressed by the C.E. mentioned above. After a good deal of discussion, the Committee considered that the decision taken by the Chief Engineer in the matter may be allowed to stand in the circumstances reported by him. ~~and he may~~ be requested to take the decision very early about adopting one of the two alternatives for the alignment behind the bund viz, an/ aqueduct or ~~and~~ siphon in consultation with the S.T.A.C. if ~~necessary.~~

4 Having regard to the consideration of the Bhadra Reser. Special Committee and the views putforth by the C.E. This Govt. feel that the decision already taken to take the channel behind the bund may stand and the further execution of the work may go ahead in accordance with the decision taken by the Chief Engineer.

5 I am sure you will agree with me that we have to take all possible steps for the speedy completion of the project and that keeping this question open any

195

longer might militate against quick progress on the work, particularly when the working season is on and this is the only time when substantial progress can be secured.

6. I am also confident that we will continue to have the same assistance and co-operation from the Team and the Committee as in the past.

With best regards,

Your sincerely,

(Minister P.W.)

Shri N.V.Gadgil,
Leader of the Irrgation & Power Team,
Committee on Plan Projects,
Planning Commissioner, Govt. of India,
NEW DELHI.

Confidential.

pwd (4 BRPs)

M. G. S. App. F. G. 3]

MYSORE GOVERNMENT

SECRETARIAT.

(*Continuation sheet draft form*).

Subj:- Alignment of the Rishi-Bank channel for linking the Shanthisagar valley - B.R.P.

To

The CEDUS Bloc.

Sir

Ref:- Your letter No P:C25[illegible]

dt 21-2-1958.

With reference to the Correspondence cited regarding the above subject I am invited to state ~~instructed~~ instructed that the Minister PWD & Sle desired ~~[illegible]~~ ~~time ago~~ that we write to Dr K.L. Rao Member of the C.W.P. ~~Suggesting that he might~~ should visit Bhadra project and give his views in regard to the alignment of the Rishi Bank channel across Shanthi Sagar valleys (~~of~~ Question which has assumed a Controversial nature owing to the difference of opinion between the planning Commission team and the local Engineers. Accordingly Dr.

WD-05446-GPB-PZS-20,000-27-9-56.

Rao was contacted over the Telephone on the 17th and it was ascertained that it would be feasible for him to visit Mysore only towards the end of 1st week of April and not earlier as he had a number of other engagements in North India.

J.T.

22/3.

It was ascertained that Dr. Rao will be visiting Mysore towards the end of 1st week of April 58.

I shall therefore request him to kindly to extend his stay further so that we may fully be taken to arrange for his visit as he is Block Right and obtain his views in the matter.

Secy. Tiruppur

Copy to: Secy. S.T.A.C & B.R.S.P.L

Committee for information.

U/S Pms

22/3 Sms 22/3/58

GOVERNMENT OF MYSORE

CONFIDENTIAL

No. PWD 14 BRP 57

Mysore Government Secretariat,
VIDHANA SOUDHA,

Dated, Bangalore,.....19

From

Secretary to the Government of Mysore,
Public Works Department, Bangalore.

To

The Chief Engineer,
Major Irrigation (South),
BANGALORE.

Sir,

Sub:- Alignment of the Right Bank Channel for crossing the Shantisagar Valley - Bhadra Reservoir Project.

Ref:- Your letter No. P.C.258 dated 21-2-1958.

With reference to the communication cited regarding the above subject, I am directed to inform you that the Minister, Public Works and Electricity desired that Dr. K.L.Rao, Member of the Central Water and Power Commission should visit Bhadra Project and give his views in regard to the alignment of the Right Bank Channel across Shanthisagar Valley. Accordingly Dr. Rao was contacted over the Telephone on the 17th instant and it was ascertained that Dr. K.L.Row will be visiting Mysore towards the end of 1st week of April 1958.

I am, therefore, to request that further necessary action may kindly be taken to arrange for his visit to the Bhadra Project and obtain his views in the matter.

Yours faithfully,

KL 5/3

(K.B.Murarappa),
Under Secretary to Government,
Public Works Department.

Copy to Secretary, Standing Technical Advisory Committee and Bhadra Reservoir Special Committee for information.

KL 5/3

Under Secretary to Government, PWD.

25/4

INSPECTION NOTE ON BHADRA RIGHT BANK CENAL ALIGNMENT FOR CROSSING OF SHANTISAGAR VALLEY.

1. Inspected Bhadra right bank canal from tunnel outlet upto weir crossing of Shantisagar on 1-4-1958 along with Mr.Rangaraja Iyengar, Chief Engineer, South and Mr.M.H. Manchigiah, Special Chief Engineer, Sharavathi Project. Mr.Rawhouser, T.C.M. expert was also present.

2. After the emergence of the canal from 23rd mile long tunnel the canal skirts round the Shanthisagar practically along half its perimeter. From the topographical features, it appears to me that it would have been very economical if the water was let down into Shantisagar and picked up again in Davanagere Branch without increasing the F.T.L. of the Tank. This would have avoided taking the canal in a detour of 14 miles traversing difficult country and affected an appreciable saving. There would have been no loss of command and even from the material aspect, the fluctuation by about 4' in the reservoir, which could have been achieved, would have been sufficient to reduce the Bad effects from health point of view. However as considerable progress has been made on canal excavation, further discussion will be confined to the consideration of the alternative alignment of the canal for the crossing of the Shantisagar Valley.

3. The canal is taken on contour till 8 miles. There are 2 proposals for taking the Davenagere canal further from this. One is to take it close to the Shantisagar bank, cross the valley by a duct supported on the bund and continue along or near the bank to 3rd mile of Branch Channel. The second proposal is to take the canal on the Northern side of the hills between which the high Shantisagar bund has been built crossing the valley by an aqueduct or Syphon. The crossing of Shantisagar valley seems to have aroused unnecessary controversies not commensurate with the problem.

~~problem.~~ It may be acknowledged that these controversies have caused definite delay in the canal construction and should no longer be allowed to retard the progress of work. Rawhouser and myself made careful inspection of the entire area and took into consideration the various view points expressed before. In fairness, I must state that I do not find any Engineering problem involved in this and the matter should have been decided by the Chief Engineer of the Project as he does the other masonry works in a project.

4. It is perfectly feasible to convey the water by a concrete duct over the built up bund without any fear of any danger to the bund. There is a free board of 18' and the duct is proposed to be constructed with base only six feet from the top of the bund. The duct is thus proposed to be supported on the dry portion of the bund and all are agreed that the half a ton per sq.ft. that will be brought on by the duct can easily be borne by the embankment without settlement. Also the duct can be made perfectly nonleaking and when built on the rear side, the leakage water, even if it there be any, can easily be drained away. The necessity of repairing the sluices in the existing banks at a future date can be provided for by giving suitable reinforcements in the ducts in the small reaches in which sluices will be located (perhaps in remodelling the sluices the present alignment can preferably be altered and the sluice ways built nearer the abutment rocks) The fact that no supporting structure is required for the duct, this method must obviously be cheaper than ~~aigment~~ aqueduct. The disadvantage of this is that the approaches present considerable difficulties. The very spurs which made it an ideal location for building the bund, come in the way of easy alignments of the canal. Some portions of the canal have to be covered so that stones from the steep sloping hills may not injure the canal.

P.....3.

5. As against the above, the alignment of the canal skirting round the hills is easier and is to be prefered. The canal is under construction along this alignment. The canal can cross the Shantisagar valley in any one of the three ~~of the~~ ways discussed below:-

The valley seems to be filled with ~~silt,~~ clay and silt, the rock being found at 40 to 50' depths as shown by borings done so far. In view of the unsatisfactory soil conditions, syphon affords no economies and is not considered. The three proposals of method of crossing the vally are:-

i) Aqueduct in a skew alignment. Length about 1400' the aqueduct is to be supported on piers spaced as wide apart as possible. Piles are to be driven to support the piers.

ii) Aqueduct in a right angle alignment approximately midway between the (i) and (iii) and opposite to temple rock projection. ~~Thes~~ Length is about 1000'.

iii) Contour canal to be continued up to the bund cross it by duct for 800' and then cross it over by a ~~xhxmx~~ short aqueduct to the temple rock to be continued along the alignment behind the temple hill. See figure( )

Each of the above may be investigated and one chosen based on purely grounds of economy. No other consideration need weigh. The choice maybe left to the judgement of the Chief Engineer in charge of the project. //

While these investigations are proceeding the canal excavation may be expedited to realise early the benefits of the very useful Lakkavalli Reservoir.

====

Copy of instructions when signed (handed over) to Dr. M. Rao 5/4/58

~~Divisional Engineer Hiriyur~~

Dr

Sir ###

Pl. put up with the connected file

11/4

W/S ### my pl. prepare note proposed to be sent to Planning Commission Please as contemplated Govt. Khadi Special Committee

5/4

INDARJIT SINGH
Joint Secretary, Finance
&
Secretary, COPP.

D.O. No: COPP(4)/38/57
MINISTRY OF FINANCE,
DEPTT. OF EXPENDITURE.

New Delhi, the 17th April 1958.

MYSORE GOVERNMENT SECRETARIAT
NO. 3564
22 APR 1958
PUBLIC WORKS MAJOR IRRIGATION

Dear Srinivasachar,

135 CF

I kindly refer to Shri Gadgil's D.O. letter No.COPP(4)/38/57-69, dated the 4th February, 1958 regarding the recommendation of the Irrigation & Power Team relating to the alignment of the Right Bank Channel and Davangere and Malebennur Branches near the Sulekere Tank. It is proposed to place this matter before the Committee on Plan Projects for their consideration on the 2nd May, 1958. I shall therefore be grateful if you will kindly have the factual note verified and send it back to me with such changes as may be proposed by the Mysore Government. I shall be grateful if you will kindly treat this as urgent.

With regards,

Yours

(Indarjit Singh)

D.K.

Shri/Shrinivasa Char,
Secretary, P.W.D.,
Mysore Government,
Bangalore.

SECRETARIAT
PUBLIC WORKS & ELEC

INSPECTION NOTE ON BHADRA RIGHT BANK CANAL ALIGNMENT FOR CROSSING OF SHANTISAGAR VALLEY.

1. Inspected Bhadra right bank canal from tunnel outlet upto weir crossing of Shantisagar on 1-4-1958 along with Mr. Rangaraja Iyengar, Chief Engineer, South and Mr.M.H. Manchigiah, Special Chief Engineer, Shravathi Project. Mr. Rawhouser, T.C.M. expert was also present.

2. After the emergence of the canal from 2½ mile long tunnel, the canal skirts round the shantisagar practically along half its primeter. From the topographical features, it appears to me that it would have been very economical if the water was let down into shantisagar and picked up again in Davanagere Branch <u>without increasing the F.T.L. of the Tank</u>. This would have avoided taking the canal in a detour of 4/4 miles traversing difficult country and effected an appreciable saving. There would have been no loss of command and even from the material aspects, the fluctuation by 4' in the reservoir, which could have been achieved, would have been sufficient to reduce the bad effects from health point of view. However as considerable progress has been made on canal excavation, further discussion will be confined to the consideration of the alternative alignment of the canal for the crossing of the Shantisagar Valley.

3. The canal is taken on contour till 8 miles. There are 2 proposals for taking the Davenagere canal further from this. One is to take it close to the Shantisagar bank, cross the vally by a duct supported on the bund and continue along or near the bank to 3rd mile of Branch channel. The second proposal is to take the canal on the Northern side of the hills between which the high Shantisagar bund has been built crossing the valley by an aqueduct or Syphon. It may be acknowledged that these contraversies have caused definite delay in the canal construction and should no longer be allowed to retard the progress of work. Rawhouser and myself

made careful inspection of the entire area and look into consideration the various view points expressed before. In fairness, I must state that I do not find any Engineering problem involved in this and the matter should have been decided by the Chief Engineer of the Project as he does the other masonry works in a project.

4. It is perfectly feasible to convey the water by a concrete duct over the built up bund without any fear of any danger to the bund. There is a free board of 18' and the duct is proposed to be constructed with base only six feet from the top of the bund. The duct is thus proposed to be supported on the dry portions of the bund and all are agreed that the half a ton per sq.ft. that will be brought on by the duct can easily be borne by the embankment without settlement. Also the duct can be made perfectly nonleaking and when built on the rear side, the leakage water even if it there be any can easily be drained away. The necessity of repairing the sluices in the existing banks at a future date can be provided for by giving suitable reinforcements in the ducts in the small reache in which sluices will be located (perhaps in remodelling the sluices the present alignment can preferably be alte and the sluice ways built nearer the abutment rocks). Th fact that no supporting structure is required for the du this method must obviously be cheaper than Aqueduct. The disadvantage of this is that the approaches present considerable difficulties. The very reason which made it an ideal location for building the bund, came in the way easy alignment of the canal. Some portions of the canal has to be covered so that stones from the steep sloping hills may not injure the canal.

5. As against the above, the alignment of the canal skirting round the hills is easier. The canal is under construction along this alignment. The canal can cros

Shantisagar valley in three of the ways discussed below-

The valley seems to be filled with silt, clay and silt the rock being found at 40 to 50' depths as shown by borings done so far. In view of the unsatisfactory soil conditions, syphon affords no economies and is not considered The three proposals of method of crossing the valley are:-

(i) Contour canal to be continued up to the bund cross it by duct for 800' and then cross it over by a short aqueduct to the temple rock to be continued along the alignment behind the temple hill. (See figure attached)

(ii) Aquaduct in a skew alignment. Length about 1400' the aquaduct is to be supported on piers spaced as wide apart as possible. ~~Piers~~ Piles are to be drim to support the piers.

(iii) Aquaduct is a right angle alignment approximately midway between the (i) and (iii) and opposite to temple rock projection Length is about 1000'.

Each of the above may be investigated and one chosen based on purely grounds of eco nomy. No other consideration need weigh. The choice may be left to the judgment of the Chief Engineer in charge of the project.

While these investigations are proceeding the canal excavation may be expedited to realise early the benefits of the very useful Lakkavali Reservoir.

(K.L.Rao)
11-4-58.

SECRETARY TO GOVERNMENT PUBLIC WORKS & ELEC. DEPTT. No. 17-4-58

MYSORE GOVERNMENT SECRETARIAT PUBLIC WORKS MAJOR IRRIGATION BRANCH NO. 3606 22 APR 1958

OFFICE OF THE MINISTER FOR PUBLIC WORKS No. 352 18 APR BANGALORE

Copy to:-

1. Chairman, CWDPC.
2. Shri D.K.Srinivassa Char, Secretary, P.W.D. Mysore, Bangalore.
3. Mr. Rangaraja Iyengar, Chief Engineer, South, Mysore P.W.D., Bangalore.
4. Director(Canals), CWDPC.

D. K. SRINIVASACHAR
Secy. P. W. & Elec. Depts.

To

Shri N.V.Gadgil,
Leader of the Irrigation & Power Team,
Committee on Plan Projects,
Planning Commission,
Government of India, NEW DELHI.

23/4/58

My dear Shri Gadgil,

Kindly refer to your letter of 4th February 1958, about the note prepared by the Team regarding the alignment of Bhadra Right Bank Channel. I have already explained to you in my previous letter of 13th December 1957, as to why it was considered ~~to be~~ advisable to leave the decision to the Chief Engineer in-charge of the Project. However, the note received from you ~~was referred to the Chief Engineer for his comments.~~ He considers the proposal of crossing the valley behind the bund by means of siphon or an aqueduct, to be the one best suited for the place, for the reasons explained in the accompanying note.

The Chief Engineer ~~further states that~~ the other Chief Engineers of this State are ~~also~~ strongly of the view that the bund should not be interefered with and the channel should be taken across the valley, at the rear of the bund. ~~He mentions that~~ A decision has been taken by ~~him~~ after considering all aspects of the case and has asked the work to be proceeded with to ensure adherence to time schedule already chalked out. Work to the extent of nearly Rs.1 lakh has already been done mainly on the excavation of the channel for the alignment behind the bund. ~~He~~ considers it ~~better~~ to leave matters as they are and carry on the alignment behind the bund. It is also stated that the cost of all the alternatives viz., aqueduct, siphon, and duct has been worked out and on comparison it is found to be practically the same for each proposal.

The matter ~~was again~~ discussed at the Bhadra Reservoir Special Committee held on 9-3-1958, during which the Committee took note of the correspondence that had passed between the State Government and the Irrigation and Power Team of the Committee on Plan Projects on the one hand, and between the State Government and the Chief Engineer, Major Irrigation (South), on the other, and also the views expressed by the Chief Engineer mentioned in the note. After a good deal of

discussion the Committee considered that the decision taken by the Chief Engineer in the matter may be allowed to stand in the circumstances reported by him. (Sri M.Narasimhiah, one of the Members of the Committee, was however, unable to subscribe to this decision).

Dr. K.L.Rao, Member, ~~The~~ Central Water & Power Commission inspected the Bhadra Right Bank Channel from the tunnel outlet upto the weir crossing of Shantisagar on 1-4-1958 along with Sri Rawhouser, T.C.M. expert. ~~He has expressed the view that~~ taking the channel by a concrete duct over the bund will present considerable difficulties. ~~He has opined that the alignment of the channel behind the bund is easier and is to be preferred.~~ He has ~~also~~ mentioned three ~~proposals~~ alternatives regarding the method of crossing the valley, ~~and as such~~ and has stated that the choice might be left to the ~~judgement~~ the Chief Engineer in charge of the project. An extract from his inspection note has been incorporated in the note accompanying this letter.

Having regard to the views of the Bhadra Reservoir Special Committee, the views put forth by the Chief Engineer, Major Irrigation (South), and the views expressed by Dr. K.L.Rao, this Government is of the opinion that the decision already taken to take the channel behind the bund may stand and the further execution of the work may go ahead in accordance with the decision ~~taken by the Chief Engineer.~~ already

I am sure, you will agree with me that we have to take all possible steps for the speedy completion of the project and that ~~keeping~~ this question, open any longer ~~might militate against quick progress of the work, particularly when the working season is on, and this is the only time in which substantial progress can be secured.~~

I am also confident that we will continue to have the same assistance and co-operation from the team and the Committee as in the past.

With best regards,

Yours sincerely

Minister, P.W.D

221

Dear Sri Indarjit Singh,

Please refer your D.O. letter No.COPP(4)/38/57 dated the 17th April 1958 regarding the alignment of the Bhadra Right Bank Channel. I am to enclose herewith a copy of letter addressed to Shri N.V.Gadgil, Leader of the Irrigation & Power Team, together with a note on the alignment of the Bhadra Right Bank Channel for placing the same before the Committee on Plan Projects, as desired.

Yours sincerely,

Secretary, P.W.D.

Shri Indarjit Singh,
Joint Secretary, Finance
and Secretary, COPP,
Ministry of Finance,
NEW DELHI.

23/5/58

1200 14 BRPS7

223

Dear Sri Indarjit Singh,

Kindly refer to your D.O. letter No.COPP(4)/38/57 dated the 17th April 1958 regarding the alignment of the Bhadra Right Bank Channel. I am enclosing a copy of letter addressed by the Minister for Public Works, Mysore to Shri N.V.Gadgil, Leader of the Irrigation and Power Team on this subject, together with a copy of its enclosure.

Yours sincerely,

Secretary, P.W.D.

Sri Indarjit Singh,
~~Joint Secretary, Finan~~
and ~~Secretary, COPP~~
~~Ministry of Finance,~~
New Delhi.

Secy Committee on plan projects,
II floor Reserve Bank Buildings,
Parliament Street
New Delhi

225

D.K.Srinivasachar, I.A.S.,
Secretary to Government,
Public Works Department.

Mysore Government Secretariat,
Vidhana Soudha,
Bangalore, dated, 26th April 1958.

DO No.PWD 14 BRP 57

Dear Sri.Indarjit Singh,

Kindly refer to your D.O. letter No.COPP(4)/38/57 dated the 17th April 1958 regarding the alignment of the Bhadra Right Bank Channel. I am enclosing a copy of letter addressed by the Minister for Public Works, Mysore, to Shri.N.V.Gadgil, Leader of the Irrigation and Power Team, on this subject, together with a copy of its enclosure.

Yours sincerely,

o/c

To

Sri.Indarjit Singh,
Secretary, Committee on Plan Projects,
IInd Floor, Reserve Bank Buildings,
Parliament Street, NEW DELHI.

M P W 8-0/Genl (P) 25/4/58
one note

My dear Shri Gadgil,

Kindly refer to your letter of 4th February 1958, about the note prepared by the Team regarding the alignment of Bhadra Right Bank Channel. I have already explained to you in my previous letter of 13th December 1957, as to why it was considered advisable to leave the decision to the Chief Engineer in charge of the Project. However, the note received with your letter has again been examined here. It is considered that the proposal of crossing the valley behind the bund by means of siphon or an aqueduct, to be the one best suited for the place, for the reasons explained in the accompanying note.

The Chief Engineer in charge of the project as also the other Chief Engineers of this State are also strongly of the view that the bund should not be interfered with and the channel should be taken across the valley, at the rear of the bund. A decision has already been taken by the Chief Engine in charge after considering all aspects of the case and he has asked the work to be proceeded with to ensure adherence to time schedule already chalked out. Work to the extent of nearly Rs.1 lakh has already been done mainly on the excavati of the channel for the alignment behind the bund. ~~This we w~~ consider that it is best to leave matters as they are and carry on the alignment behind the bund. It is also stated that the cost of all the alternatives viz., aqueduct, siphon, and duct has been worked out and on comparison it is found to be practically the same for each proposal.

The matter has also been discussed at the Bhadra Reservo Special Committee held on 9-3-1958, during which the Committe took note of the correspondence that had passed between the State Government and the Irrigation and Power Team of the Committee on Plan Projects on the one hand, and between the State Government and the Chief Engineer, Major Irrigation (South), on the other, and also the views expressed by the Chief Engineer mentioned in the note. After a good deal of discussion the Committee considered that the decision taken by

the Chief Engineer in the matter may be allowed to stand in the circumstances reported by him. (Sri M.Narasimhiah, one of the members of the Committee, was however, unable to subscribe to this decision).

Dr. K.L.Rao, Member, Central Water & Power Commission, inspected the Bhadra Right Bank Channel from the tunnel outlet upto the weir crossing of Shantisagara on 1-4-1958 along with Sri Ramhouser, T.C.M. expert. A copy of the note drawn up by him in this connection may be available ~~with~~ to you. He has mentioned three alternatives regarding the method of crossing the valley, and has stated that the choice might be left to the Chief Engineer in charge of the project. An extract from his inspection note has been incorporated in the note accompanying this letter.

Having regard to the views of the Bhadra Reservoir Special Committee, the views put forth by the Chief Engineer, Major Irrigation (South), and the views expressed by Dr. K.L.Rao, this Government is of the opinion that the decision already taken to take the channel behind the bund may stand and the further execution of the work may go ahead in accordance with the decision already taken. The alternatives suggested by Dr. K.L.Rao are, however, kept in view and whichever is found feasible in consultation with the Chief Engineer in charge on examination will be adopted.

Yours sincerely,

Minister, P.W.D.

To

Shri N.V.Gadgil,
Leader of the Irrigation & Power Team,
Committee on Plan Projects,
Planning Commission,
Government of India, New Delhi.

24/4/58

Note on the alignment of the Bhadra Right Bank Channel to cross the Shantisagara Valley.

The trial pits excavated show that the Shantisagara tank bund is made of debris and loose soil for more than 20 ft.depth. It is probable that there is an old well-settled consolidated bund at lower levels and the raising of the bund done subsequently is by dumping loose excavated stuff. The bund of Shantisagar tank should not therefore be interfered ~~within~~ anyway.

The question that exercises the mind is not the difficulties likely to be met with in constructing a leak-proof R.C.C. Duct on the Shanthisagara Bund. ~~Nor is any doubt felt about the capacity of our Engineers to design and execute such a work.~~ The fear is that the bund, though an old and well-settled one, ~~will~~ may develop a leak at some future date, as ~~it~~ has happened in other tanks in the State, which may lead to the settlement and scour of the material below the duct. Such a phenomenon will not always be visible at the surface and this may lead to a sudden undermining of the foundations of the duct. This may lead to a total failure of the duct resulting in water supply to lands being totally cut off.

The Irrigation sluices of the tank are badly leaking. They are probably the old barrel type of brick masonry. The R.C.C. Duct cannot be taken up unless these sluices are opened out and reconstructed. They are located ~~at~~ 45 ft. below the top of the bund. To construct them, a length of at least 100 ft. of bund on both flanks will have to be cut open for a depth of 50 ft. or more. This length of 100 ft. will have to be filled up after the repairs. The duct will thus be crossing a freshly made up strip of 100 ft. at two places along the bund. These two strips will practically cover a major portion of the length of this short bund. The two strips will certainly form the weakest link in the Duct as these portions are subject to differential settlement, as compared to the rest of the bund which remains undisturbed.

This work of reconstruction of the sluices will have necessarily to precede the construction of the duct. This

This work involves at least two working seasons. The tank will have to be depleted to a fairly low level to enable the work being taken up. This will in turn adversely affect irrigation under the tank. It will also interrupt road-traffic on the bund and to avoid this, costly diversions have to be provided. The adoption of an aqueduct or siphon behind the bund in the valley, is not subject to these adverse conditions and there will be no intangibles as in the case of the other proposal. The bund remains undistrubed. The repairs to the sluices need not precede the construction of the aqueduct. These repairs can be taken up at any time independently of the latter. Irrigation below the bund will be least disturbed by this alternative.

The objection that a breach of the bund may wash away the aqueduct can be overcome by suitably designing the structure and providing long spans between supports and having sufficient water-way for maximum expected flows. The foundations will be taken down to hard bed and there should be no anxiety about them, even in case of a breach of the tank.

Dr. K.L.Rao, Member, Central Water and Power Commission, who inspected the Bhadra Right Bank Channel from tunnel outlet upto the weir crossing, Shanthisagar on 1-4-1958 along with Sri Rawhouser, T.C.M. expert has given the following views in the matter:

"The canal is taken on contour till 8 miles. There are 2 proposals for taking the Davanagere canal further from this. One is to take it close to the Shantisagar bank, cross the valley by a duct supported on the bund and continue along or near the bank to 3rd mile of Branch channel. The second proposal is to take the canal on the Northern side of the hills between which the high Shantisagar bund has been built crossing the valley by an aqueduct or Syphon. It may be acknowledged that these controversies have caused definite delay in the canal construction and should no longer be allowed to retard the progress of work. Rawhouser and myself made careful inspection of the

the entire area and took into consideration the various view points expressed before. In fairness, I must state that I do not find any Engineering problem involved in this and the matter should have been decided by the Chief Engineer of the Project as he does the other masonry works in a project.

t is perfectly feasible to convey the water by a concrete duct over the built up bund without any fear of any danger to the bund. There is a free board of 18' and the duct is proposed to be constructed with base only six feet from the top of the bund. The duct is thus proposed to be supported on the dry portions of the bund and all are agreed that the half a ton per sq. ft. that will be brought on by the duct can easily be borne by the embankment without settlemen Also the duct can be made perfectly non-leaking and when built on the rear side, the leakage water even if it there be any can easily be drained away. The necessity of repairing the sluices in the existing banks at a future date can be provided for by giving suitable reinforcements in the ducts in the small reaches in which sluices will be located (perhaps in remodelling the sluices the present alignment can preferably be altered and the sluice ways built nearer the abutment rocks). The fact that no supporting structure is required for the duct this method must obviously be cheaper than Aqueduct. The disadvantage of this is that the approaches present considerable difficulties. The very reason which made it an ideal location for building the bund, came in the way of easy alignment of the canal. Some portions of the canal has to be covered so that stones from the steep sloping hills may not injure the canal.

" As against the above, the alignment of the canal skirting round the hills is easier. The canal is under construction along this alignment. The canal can cross the Shantisagara valley in three of the ways discussed below:-

" The valley seems to be filled with silt, clay and silt and the rock being found at 40 to 50' depths as shown by borings done so far. In view of the unsatisfactory soil

soil conditions, syphon affords no economies and is not considered. The ~~xxxx~~ three proposals of method of crossing the valley are:

(i) Contour canal to be continued up to the bund cross it by duct for 800' and then cross it over by a short aqueduct to the temple rock to be continued along the alignment behind the temple hill.

(ii) Aqueduct in a skew alignment. Length about 1400' the aqueduct is to be supported on piers spaced as wide apart as possible. Piles are to be drim to support the piers.

(iii) Aqueduct is a right angle alignment approximately midway between the (i) and (iii) and opposite to temple rock projection Length is about 1000'.

Each of the above may be investigated and one chosen based on purely grounds of economy. No other consideration need weigh. The choice may be left to the judgment of the Chief Engineer in charge of the project.

While these investigations are proceeding the canal excavation may be expedited to realise early the benefits of the very useful Lakkavali Reservoir. ||

B/Sms

No. 5965 Plan comparative

To

Office of the Chief Engineer,
Major Irrigation—South,
BANGALORE.
28-5-58.

MYSORE GOVERNMENT SECRETARIAT
NO. [illegible]
30 MAY 1958
PUBLIC WORKS BRANCH

MYSORE GOVERNMENT SECRETARIAT
NO. 429
3 JUN 1958
PUBLIC WORKS

The Secretary to Government,
P.W.D. & Electricity Departments,
Vidhana Soudha, BANGALORE.

Sir,

SECRETARY TO GOVERNMENT
31 MAY 1958
PUBLIC WORKS

Subject:- Bhadra Right Bank Channel alignment for crossing Shantisagar Valley.

Reference:- Dr.K.L.Rao's Inspection Notes dated 11-4-58 copied to you and this office.

The three proposals for crossing the Valley suggested in the Inspection Notes of Dr.K.L.Rao have been surveyed and estimated and it is found that the third proposal of an aqueduct in a right angle alignment approximately mid-way between the bund and ~~sanctioned~~ second site of aqueduct in a skew alignment opposite to the temple rock projection works out to Rs.21.30 lakhs and is the cheapest as per comparative statement enclosed. An alternative design of a Bow-string Girder for the aqueduct is being worked out to further reduce the cost. Under the circumstances, I am going ahead ~~into~~ the sanction of the estimate for the aqueduct as mentioned in the penultimate para of Dr.K.L.Rao's Inspection Notes.

Yours faithfully,
C.K.Rangaraja Iyengar
28/5

(C.K.Rangaraja Iyengar)
Chief Engineer,
Major Irrigation-South.

Bnm:28/5.

To

The Secretary to Government,
P. W. D. & Electricity Departments,
Vidhana Soudha, BANGALORE.

Sir,

Subject:- Bhadra Right Bank Channel alignment for crossing Shantisagar Valley.

Reference:- Dr.K.L.Rao's Inspection Notes dated 11-4-58 copied to you and this office.

The three proposals for crossing the Valley suggested in the Inspection Notes of Dr.K.L.Rao have been surveyed and estimated and it is found that the third proposal of an aqueduct in a right angle alignment approximately mid-way between the bund and restricted site of aqueduct in a skew alignment oncelte to the terrale rock projection works out to Rs.21.20 lakhs and is the cheapest as per comparative statement enclosed. An alternative design of a Pot-string Girder for the aqueduct is being worked out to further reduce the cost. Under the circumstances, I am going ahead into the sanction of the estimate for the aqueduct as mentioned in the penultimate para of Dr.K.L.Rao's Inspection Notes.

Yours faithfully,

(C.K.Rangaraja Iyengar)
Chief Engineer,
Major Irrigation-South.

Bnm:28\5.

Comparative cost of Acqueduct at Different Sites - Behind Shantisagar Tank Bund.
(Only pipe foundation is taken for comparaision).

Sl.No	Particulars.	Site No.1	Site No.2	Site No.3.	
1.	Cost of R.C.C.Acqueduct with pipe foundation.	5,31,000	15,21,000	21,10,000	
2.	Cost of R.C.C.Duct over Shantisagar Bund.	5,58,000	-	-	
3.	(a) Open duct for approach and draft.	1,62,000	1,05,990	-	
	(b) Open channel upto Common point.	-	16,000	16,000	
4.	(a) Covered duct for the approach.	5,72,200	2,42,000	-	
	(b) Extra cost of providing protecting works for deep scours at 42/2 and 45/2.	2,30,000	2,30,000	-	
5.	Cost of deviating the Channagiri-Malebennur Road.	1,25,000	-	-	
6.	Extra cost for improving the curvature.	1,00,000	2,51,482	-	) For site) No. 2 & 3) cost of
7.	Miscellaneous works such as machinery and power, petty supervision etc.,	76,800	4,528	4,000	) machinery & power etc. is included in main estimate.
		23,55,000	23,71,000	21,30,000	

Chief Engineer, M.I.(S).

M. G. S. App. F. G. 3]

MYSORE GOVERNMENT

SECRETARIAT.

(*Continuation sheet draft form*).

PWD 14 BRP 59

2

Sub: Alignment of the Right-Bank channel for evolving the Shankarapura valley - B.R. Project.

To

The CE Rys. Bangalore

Sir

Ref: Your letter No. P.E 258 dt 21.2.58

I am directed to forward herewith a Copy of letter No ~~PWD 14~~ B.P.W. 80 dt 25.6.58 addressed to the Secretary with a Copy of its enclosure, addressed to Sri N.V. Gadgil, leader of the Team, Committee on Plan Projects for your information ~~and necessary action~~

Please see correspondence at pages 227-231 c/f.

4/F

16/6

V/S Dwd

13/6/58 13/6/58

Issued 25/6

WD 0258—GPB—PZS-1,20,000—1-7-55.

GOVERNMENT OF MYSORE

No. PWD 14 BRP 57

Mysore Government Secretariat,
VIDHANA SOUDHA,

Dated, Bangalore, 25 June ...*195* 8.

FROM

Secretary to the Government of Mysore,

~~Jeishta~~, Ashada 4 Saka Era 1880.

Public Works Department, Bangalore.

To

The Chief Engineer,
Major Irrigation (South),
BANGALORE.

Sir,

Sub:-Alignment of the Right Bank Channel for ~~ss~~ crossing the Shantisagara valley - Bhadra Reservoir Project.

Ref:-Your letter No. P.C. 258 Dt. 21-2-1958.

I am directed to forward herewith a copy of letter No. MPW 80 dated 25-4-1958 together with a copy of its enclosures addressed to Sri.N.V. Gadgil, Leader of the Team, Committee on Plan Projects for your information.

Yours faithfully,

(K.B.Murarappa),
Under Secretary to Government,
Public Works Department.

PK:21-6/2.

PWD 14 BRPS 58

Sub:- Bhadra Right Bank Channel alignment for CM Mig Shanthisagar valley

To

The CE (HQ), Bangalore

Sir

Ref: your letter No 596/ dt- 29-5-58.

In the above letter it requested that abstract estimates of the three alternatives for taking the channel from the Shanthisagara valley as suggested by Dr K.L. Rao may kindly be forwarded to ~~Headquarters~~, for being placed before the next Bhadra project meeting of the Board this intimation. The matter may be treated top priority basis.

25

N.V. Gadgil

Phone No.46762
Ferozshah Road,
New Delhi.

August 2, 1958.

My dear Shri Jetti,

By this time you must have been quite aware about the decision of the Team for Power & Irrigation which was asked to study the Lakkavalli Project. The Team recommended the taking over of the canal over the bund of Shantisagar. The Members of the Team considered some alternative and the proposal of Dr. K.L. Rao also and the Team is still of the view ~~consideration~~ that the recommendation made by the Team should stand.

I am, therefore, requesting you to let me know the position with respect to the implementation of the recommendations of the Team in general and in particular about the recommendation in connection with the Shantisagar issue. I shall feel very much obliged if you inform me as early as possible as the Committee On Plan Projects want the information so that they may make final decision in the matter.

Yours sincerely,

N.V. Gadgil

(N.V. Gadgil)

Shri B.D. Jetti,
Chief Minister,
Mysore State,
Banglore.

Dear Sri Gadgil,

Kindly refer to your letter of 2nd August 1958 with regard to the alignment of Bhadra Right Bank Canal. A detailed note on the subject has already been forwarded to you by the Minister for Public Works and Electricity of this State, in his D.O. letter No.MPW 80 dated 25-4-1958 In the circumstances mentioned therein, this Government is of the view that the decision already taken may stand, and that further execution of the work may go ahead accordingly.

p 229 c F.

As regards the other recommendations of the Team, this Government have agreed with them generally as indicated in the statement forwarded to you, by the Minister for Public Work and Electricity in his D.O. letter No.1068 dated 5-12-1957 ~~addressed to you.~~

p. 114 c F of the linked file.

Yours sincerely,

CHIEF MINISTER.

Sri N.V.Gadgil,
Leader of the Irrigation
Power Team,
Committee on Plan Projects,
Planning Commission,
Government of India,
New Delhi.

C. F. No. 45] GOVERNMENT OF MYSORE

259

No. 1482/S
Encls.

OFFICE OF
Office of the Chief Engineer,
Major Irrigation—South,
BANGALORE.

Date 11.8.58

To

The Secretary to Government,
Public Works Department, Bangalore.

MYSORE GOVERNMENT SECRETARIAT
NO.
11 AUG 1958
PUBLIC WORKS BRANCH

Sir

Bhadra Right Bank channel - alignment for crossing Shantisagar valley.

With reference to your letter No.PWD 14 BRP 57 dated 22.7.58, I write to invite your reference to this office letter No.596/S dated 29.5.58 wherein a comparative statement showing difference of abstract copy of the estimate for all the three alternatives as suggested by Dr.K.L. Rao has been enclosed, for the purpose of placing before Bhadra Project Board.

Yours faithfully,

DRAFT APPROVED BY CHIEF ENGINEER

(C.K.Rangaraja Iyengar)
Chief Engineer,
Major Irrigation-South.

bvb.5.8

MYSORE GOVERNMENT SECRETARIAT
NO. 7136
13 AUG 1958
PUBLIC WORKS MAJOR IRRIGATION BRANCH

The main file has been submitted separately.

Additional letters after the receipt of the sanction

8d
19/8/58

MS
19/8/58

B. D. JATTI,
Chief Minister.

"VIDHANA SOUDHA
BANGALORE-1,

Dated. 18th August, 1958

Dear Sri Gadgil,

Kindly refer to your letter of 2nd August 1958 with regard to the alignment of Bhadra Right Bank Canal. A detailed note on the subject has already been forwarded to you by the Minister for Public Works and Electricity of this State, in his D.O. letter No.MPW 80 dated 25th April 1958. In the circumstances mentioned therein, this Government is of the view that the decision already taken may stand, and that further execution of the work may go ahead accordingly.

As regards the other recommendations of the Team, this Government have agreed with them generally as indicated in the statement forwarded to you, by the Minister for Public Works and Electricity in his D.O. letter No.1068 dated 5-12-1957.

Yours sincerely,

Sd/-

(B. D. Jatti.)

Sri N.V.Gadgil,
Leader of the Irrigation
Power Team, Committee on
Plan Projects, Planning Commission,
Government of India,
N E W D E L H I.

BSR.

MYSORE PUBLIC WORKS DEPARTMENT.

No. 4490-91
Encl.

Office of The Superintending Engineer,
B.R. Tunnel Circle, B.R.Tunnel Colony P.O.
Channagiri Taluk, Shimoga Dist.
Dated the 2nd September 1958

To

The Under Secretary to Government,
and Secretary, Bhadra Project Board,
Public Works Department,
Vidhana Soudha.

Sub:- Bhadra Right Bank Channel alignment for crossing Shantisagar Valley.

Ref:- Your No.P.W.D. 14 BRP 57 Dated 22-7-58.

---::0::---

Sir,

The required Abstract estimates of the three alternatives for taking the channel to cross Shantisagar Valley, as suggested by Dr.K.L.Rao, have been to-day forwarded to Chief Engineer, Major Irrigation (South), in 15 cppies.

MYSORE GOVERNMENT PUBLIC WORKS MAJOR IRRIGATION
NO. 8038
5 SEP 1958

Yours faithfully,

(M.C.Bastawalla),
Superintending Engineer,
Bhadra Canal Circle.

sk/2/9.

Proceedings of the Thirty-third meeting of the Standing Technical Advisory Committee held in the Chambers of the Minister for Public Works on 10th July 1957 at 3-30 p.m.

:*****:

Present:-

1. The Minister for Public Works (Chairman).
2. The Secretary to Government, P.W. & Elec. Dept.
3. Shri M.G.Rangaiya, B.A., B.E.
4. " B.S.Narasinga Rao, B.A., B.E.
5. " M.N.Lakshmana Rao, B.A., B.E.
6. " N.Neelakantappa, B.A., B.E.
7. " K.S.Gangadhara, B.E.
8. " V.Ganesh Aiyar, B.A., M.I.E., M.I.M.E.
9. The Chief Engineer (General)
10. The Chief Engineer, Major Irrigation (South).
11. Shri H.Channiah, B.E. (Secretary)

---

(1) Confirmation of the proceedings of the Thirty-second meeting held on 30th December 1956.

Working Tables for the Bhadra Project.

It was stated that the working tables had been prepared by the Department and was placed before the Sub-Committee appointed for the purpose. The Sub-Committee could not finalise them at their previous meeting as the Chief Engineer (Electricity) could not attend that meeting. Since his opinion was necessary in connection with the quantity of water allotted for power purposes, it was proposed to be finalised at the next meeting of the sub-committee.

It was pointed out by the Secretary, P.W.D. that this was an urgent matter since the Government of India and the Tungabhadra Board also had been asking for the working tables and should be finalised soon.

The Chairman said that the Sub-committee meeting may be convened as quickly as possible, say by the end of July and a decision taken on this subject.

Santekadur Valley Acqueduct.

It was noted that the work had been completed and water allowed in the acqueduct.

Tunnel machinery.

It was explained by the Secretary, P.W.D. that

in view of the present foreign exchange difficulties the question of obtaining the machinery available with local firms and those which are surplus to the requirements of the other projects in India was explored. Keeping the requirements of both Bhadra and Sharavathi projects a Team of Engineers had been sent by Government to Bhakra-Nangal Project where certain machinery were stated to be available for being spared to other projects. The Chief Engineer, Major Irrigation (South) had prepared a list of machinery that could be procured locally without asking for any foreign exchange. The purchase of machinery which could not be procured from any of the above two sources was under consideration of Government and it was proposed to prevail upon the Government of India to make available foreign exchange to the extent that is absolutely necessary. At the instance of the Finance Department the question of getting the tunneling work done by the Mining Authorities was also examined. The Managing Director together with his experts and the Chief Engineer inspected the spot some time back and they were finally of the view that the Mining Undertakings could not take up this work, which should be executed only by the P.W.D.

Estimate for Rs.24.42 crores for Bhadra Project.

It was understood that the Sub-Committee constituted for the purpose had finalised the items relating to Dam, Left Bank Channel and the first section of the Right Bank Channel and that the estimate for the portion of the Right Bank Channel beyond the tunnel had not yet been reviewed by them.

The Chief Engineer, Major Irrigation (South) was requested to submit to Government such of the estimates as had been reviewed by the Sub-Committee so that

parts of estimates could be sanctioned and regularised.

Extension of the Tunga Left Bank Channel beyond 63rd mile.

The Superintending Engineer, Tungabhadra Valley Circle, stated that he had asked for additional staff for carrying out the investigation about fully utilising the available waters as required by the S.T.A.C., but he had been asked to find the staff by diverting them from other works. He said he would take up this work shortly.

Programme of works for Bhadra Project for 57-58.

The Secretary, P.W.D. said that when this question came up before the Bhadra Special Committee, they resolved that the Chief Engineer should draw up a revised programme so that the entire amount of the estimate may be spent and the work completed within the Second Plan Period.

The Chief Engineer was requested to expedite the submission of the revised programme.

The proceedings were confirmed with the above observations.

(2) Alignment of the Bhadra Right Bank Channel beyond Hiremalali Tunnel.

The Secretary of the Committee said that Committee had inspected the spot on 17-3-57 and had discussions about the alternatives at their preliminary meetings held on 2nd April and 15th June 1957 (Copies of proceedings enclosed). He also read a brief resume about the opinion expressed by the members and the decision taken by the Committee.

Shri Narasinga Rao stated as follows:-

" I have heard the report read by the Secretary. It is very necessary to explain the reasons in great detail for the stand that I have taken. Before doing so, I wish to inform my friends who were not members

of the Committee in 1947 that this subject was the first item that was discussed by the S.T.A.C. in their very first meeting after the works were started in 1947. All these four alternatives, contouring round the water-spread, dropping into the tank as proposed in the project, taking the channel on the bund and taking the channel behind the tank were discussed. They did not favour the dropping nor the crossing on the tank bund and they decided that the other two alternatives, contour and taking the channel behind the bund may be examined in conjunction with and suited to the best tunnel alignment. Davangere Channel in rear of the bund will completely avoid the Sulekere Tank. (Vide page 13 para 5 of the report of Bhadra Project).

Here Mr.Rangaiya observed that the 1947 proposal was quite different because the channel was to be started 90 feet above bed at the reservoir. This would have involved the cutting of the bund for more than 20 feet deep. The present proposal is to start the channel at 100 feet i.e. 10 feet higher. The 1947 discussion has therefore no bearing on the present proposal.

The resume of the discussions put up by the Secretary reveals clearly that all the above four alternatives were not placed at the same time before the Standing Committee during their inspections of the same area, twice, to assess the correct position out of the maze of figures. Only three proposals excluding the alternative of carrying the channel on the tank were placed during their inspections and they took a decision after discussing the merits of the three proposals.

Fourth proposal i.e., on the tank bund was not before the Committee during the inspections. If Chief Engineer had felt this is another alternative as he seems to have now felt, he should have put this with the other three proposals. The team would have had the views of the Committee on all the four proposals. It is inexplicable to me, why the Chief Engineer did not do so (Place all the four proposals) in the first instance before the Standing Committee instead of placing first the same before the team of Government of India unless it be is because the team did not favour the proposal of dropping with which he had identified himself. The proposal of syphon was favoured by the Committee in their preliminary meeting held on 2-4-1957 by some members and not by all.

In this connection I wish to invite reference to the concluding para of the note on alternative alignments by the members of the Irrigation and Power Team of plan projects. They have stated that this proposal on the bund has found favour with practically all the members of the Standing Committee and the Project authorities. It is a very incorrect statement to put it mildly. This subject was brought up by the team, when members met the team in the Residency. All the members stated definitely that this was not before the Committee and they will re-examine the proposals on its merits if placed. In fact I told Mr. Honda the spokesman of the team that we have not agreed. The Superintending Engineer was against the proposal. I have brought this to the kind attention of the Minister lest Government might get the impression that we had favoured the proposal before them and that we are discussing merits and demerits behind them.

Turning to the subject proper, the committee have rejected the proposals of contour and dropping and have

approved that Malebennur channel might be aligned with the new level and executed straightaway.

The alternatives for discussion will be those for Davangere channel. The alternatives are (1) Trough over the bund (2) Channel in rear of the bund by syphon or acqueduct. The problem is the negotiation of a big dip behind the Sulekere bund. It is not across any flowing stream i.e. not a live valley with problems of the probability of future scour necessitating designs for foundation and unprecedented flood disposal. In all these proposals, I may bring to the kind notice of members that a separate provision of an acqueduct at a cost of 4.35 lakhs has been made for crossing the Sulekere waste weir valley. The proposals are therefore to negotiate a dry deep low bit of the original valley. Further after good deal of discussion on the omissions in the one proposal, and additions to the other, the Committee have opined that all the alternative proposals cost the same practically. Let me examine the proposal in this context.

Regarding trough it is a novel idea in India and in Mysore at any rate, of taking a big channel on the bund of a deep tank in service. I have seen channels taken on earthen bank and I know with what results. It was exemplified recently by the huge breach of the tank of the low level of Tungabhadra channel at the first flow of water. This proposal was not favoured by the Committee in 1947 as stated by me already.

This proposal on the bund has these disadvantages:-

1. It has potentiality of endangering the bund during execution. An open trench 21 x 11 for 1400 ft. has to be dug on the bund. Such a trench if left open (as it will be left open for sometime) what damage it can do during any rainy day (which is not under our control), I leave

this for members to ponder. This is enough to show that this proposal is not a sound one.

2. The elaborate arrangements needed to make the structure leak-proof and the preventing of roots of huge trees on the bund from becoming capillary tubes. With all these measures, one cannot be cent per cent leak-proof.

3. There is no elasticity in execution. In these days of difficulty of procurement of iron and steel there may be days of no work, while execution of this work has to be done round the clock.

4. There is restriction of working area and hardly any space for collection of materials. This adds to the construction difficulty.

5. The road from Channigiri to Davangere passes on the bund. Traffic has to pass on the bund only during construction as there is no possibility of diversion. Tank in front and deep gorge behind. The negotiation of traffic with the materials of excavated stuff and centering in the restricted space offer very difficult problem during construction.

6. To add to this, it offends the aesthetic value. This is a magnificient lake with wide water-spread. The trough sticks as continuous wall over the bund 8 feet high shutting all view of this lake. I cannot subscribe to this proposal on this one ground.

In these circumstances, with all respect to the elders in profession and with all the regard to the opinion of my friends I submit that it will be tragic indeed if channel is taken on the bund in as much as it has potentiality of endangering bund, difficulty of making the structure absolutely leak-proof, noclasticity in execution, construction of working space and the knotty problem of negotiating the traffic during execution; while the other proposal of syphon crossing is a straight forward

work with elasticity in execution, freedom of action, no uncertain factors to contend, the large working space and with equal cost if not less(I am positive it will be less).

I would like to say few words on the observations made by the members on the proposal of syphon. It is stated there will be air locks, ~~xxxxx~~ vibrations etc. This is not the type of raising the water over an obstruction (as in Kempabhudi tank). This is an inverted syphon. There can be no air lock, as the whole length will be below the energy line and will be no vibration as this whole length will be under positive pressure. No negative pressure at any point. (There will be air locks even in pipes under pressure when a pipe is emptied and refilled.) There are hundreds of syphon acqueduct etc., in the grand anicut canal and a dozen ~~x~~ of them in Marikanave left channel. The construction in this case is very easy. The structure will not be against any nalla or flowing stream. No diversion of water during construction. Straight forward work. I am positive that the proposal will be the most enonomical too, due to the facilities it has for execution. (To give an example, recently executed in Mysore, is the syphon on the Handi hall for the Shimsha power channel. The present problem is almost repliça of the problem of this crossing. The problem is similar. Alternatives for crossing of the bund by an acqueduct over 100 feet piers, by syphon, by contour, by construction of a reservoir by bund were all examined and this Standing Committee approved the syphon. This is 1884 feet. long and difference of head is 104 feet and pipe of 7 feet diameter is laid simply on ground, just as penstock, anchored at the joints. The pipes syphon which is 911' diameter in this scheme can be laid on the ground and the head is much less nearly 70 feet. Tungabhadra workshop

have prepared large diameter pipes for these syphons.

In this connection, I would commend the words of the greatest Physicist with regard to the effect of fall out of nuclear tests. This Professor Marcus Miphant, Australian top nuclear scientist says " Much is made of the fact, that scientific opinion is divided regarding the effect of nuclear test. There is no such as rated dose of radiation (In this case rated dose of measures for leak-proof)." He reflected a very general sentiment when he said " as a Scientist I feel that when experts disagree one should play safely. I am positive that trough over the bund is very very risky, costlier, while the proposal of the syphon is the safest and is the most economical and can be constructed with ease.

I have expressed my misgivings, because the trough proposal is hemmed in by reservations and very uncertain factors. Hence for reasons which I have stated I say emphatically that it is highly tragic to take the channel on the bund and I am equally positive that syphon will be the most economical with no uncertain factors and straight forward work and will leave the Sulekere bund and tank undisturbed.

Shri K.S.Gangadhara said he would not agree that excavation in the bund for purposes of constructing a flume would endanger the bund as it was merely an excavation about 8 feet over the water level and even if it should rain during the course of execution of the work the water in the trench could be drained off. Referring to the construction difficulties of putting up a R.C.C. trough mentioned by Shri Narasinga Rao, Shri Gangadhara said that passage of traffic over the bund during execution of the work should not present any difficulty since the bund was wide enough to allow traffic even during execution of work, and the work could be so arranged that it could be carried out without obstructing the traffic. He

instanced the work of Arkavathi bridge where the road was widened without deviating the traffic. He said Even when military conveyances were plying on the road, he would not agree with Shri Narasinga Rao in his statement that the syphon proposal and the trough proposal would cost about the same amount. The alternative of constructing an acqueduct was also not sound. He added that he was firmly of the view that the trough proposal was the cheapest as explained by him in his note furnished to the Secretary of the Committee and therefore preferred taking the channel over the bund.

The Chief Engineer (General) said that his main objection to the trough proposal was that an earthen bund was not leak-proof and further when an R.C.C. duct is taken over it the bund may sink. Even in the case of R.C.C. flume wherever there are expansion joints leaks develop in the joints. Even if the joints are made leak-proof by inserting steel pipes and conduits, the question of sinking of the bund will still be there. In order that an irrigation of nearly 150,000 acres of land under the tank may not be jeoparadised in the event of a mishap to the bund, he objected to the trough proposal and preferred an acqueduct behind the bund for crossing the valley. He added that high acqueducts even up to 100 ft. had been put up elsewhere in the country.

Shri Neelakantappa stated that the argument against the proposal to take the channel over the bund seemed to centre round the factor of absolute safety. Sulekere Tank Bund cannot be compared with other tank bunds which are designed for a top width of 10 to 20 feet. It had a top width of 150 feet and the bund had stood for a number of years and had consolidated itself very well. Even if half the width of the bund was washed out the rest of it should be able to stand the pressure.

If the Sulekere tank bund is not considered safe and were to fail, then even a siphon or an acqueduct constructed behind the tank would not be safe and might get washed away in the event of the bund giving way. The third point was about the extra load coming on the bund by introducing the trough. As pointed out by Shri Rangaiya the extra load was negligible compared to the vast botton width and the weight of the bund and as such there was no apprehension that there would be any further settlement of the bund. Referring to the aesthetic view, he added that since the trough would be put up in the rear of the bund a projection of about 8 feet at the back of the bund would not affect the aesthetic view, and the duct can be made to appear beautiful. Mr. Narasinga Rao stated that it is not in the rear of the bund but it is in front. Hence the main objection. Regarding the leaks from expansion joints in the duct, he said that suitable precautions can be taken to lead away the water by means of small drains, as after all the leaks may not be appreciable. Considered from all aspects he was of the view that there was no danger in the trough proposal as apprehended by some members and felt that this was the best and the cheapest proposal.

Shri M.N.Lakshmana Rao was of the view that iw would not be practicable to have a leak-proof duct as there would be a number of joints and on account of expansion and contraction there are bound to be leaks. When the duct was buried under earth the leaks will not be visible and would endanger the bund. The question of stability of the bund had also been raised. By capillary action and other considerations even though there was small weight over the bund, due to unequal settlement there may be danger to the bund. He therefore considered that it would be better to leave the bund alone and think of an

independent method of crossing the valley either by means of acqueduct or siphon. Acqueducts were generally preferred in cross drainage works because of certain inherent drawbacks in the siphon system such as the tendency to get silted up etc.

Shri Gangadhara remarked that the difficulty with regard to the acqueduct proposal was one of finding suitable foundation as good rock was not available even at a depth of 40 to 50 feet and the cost would be enormous if suitable foundations are to be secured.

Shri Gahesh Iyer said that Shri Neelakantappa had summarised his views. He also considered that that the proposal for a ~~xxx~~ trough was the most suitable one.

Shri Rangaiya said that before the trough proposal was put up before the Committee he was in favour of dropping the channel into the Sulekere Tank as it would serve as a natural water duct. The main objection was dropping it from a height of 30 feet and as such this had to be given up. The other two proposals were the acqueduct and the concrete siphon. He would have preferred the siphon to the acqueduct because the acqueduct was ~~xx~~ too high. Now that the trough proposal was before the Committee he considered it more suitable. As regards the fears expressed by the members about the stability of the bund, Shri Rangaiya said that with his long experience regarding earthen bunds he could say that Sulekere Bund had no comparison with any other bund in Mysore. It was a hill saddle by itself and had lasted for centuries. Taking a duct over it will not endanger the bund as he pointed out at the preliminary meeting. While cutting open the bund the nature of the soil would be known and if the bund required strengthening necessary precautions could be taken. Even if there should be any leaks as apprehended by some members, the water could be drained off easily. Regarding construction difficulties,

if necessary meterials are kept ready the work can be completed in about four months and can also be so phase that it is completed before the rains set in. Even supposing the tank was full during execution of the work, the bund was wide enough and even half its width could stand the pressure of water. If any danger is apprehended, sluices could be provided in the waste weir and the water level in the tank can be reduced if necessary. As regards the aesthetic effect, the bund itself can be raised 10 feet and the entire length levelled up it would improve the view. He suggested that the Chief Engineer and some of the members might examine the plans and see if the duct could not be taken in the rear of the bund, in which case there would be no difficulty at all. He was therefore of the view that the proposal to take the channel over the bund by means of a duct was the best one and the construction difficulties can be overcome by having materials ready and by posting competent officers for the work.

Sri Gandadhara said that the point of aesthetic value raised by Sri Narasinga Rao was a very pertinent one. But it could be overcome by making the R.C.C.flume appear neat and beautiful. Shutting off the lake view by the R.C.C.flume sticking 8 feet high above the road level could be eliminated by raising the top of the bund from the soil obtained from the excavation. The R.C.C. flume would serve something like a parapet on the lake side.

The Superintending Engineer, Tungabhadra Valley Circle said that apart from the opinion expressed by him in his note with regard to taking the channel over the bund, he would like to add that the width of the tank bund at the left end was only 45 feet as against 150 feet in other places. So also was the sluice portion. In March 1951 there was some scour in the bund and people were afraid that the tank would breach. On examination it was found that slight leakage had appeared on the outer side of

the bund in the form of sweating, though the leakage could not be located. This indicated that the bund required strengthening.

The Chief Engineer, Major Irrigation (South) was of the view that all the three or four proposals other than the proposal to drop the channel into the Sulekere Tank had some technical defect or the other, whereas the dropping proposal was free from any of these defects. Water can get into and out of the tank without any difficulty by means of an open channel. Of course there would have to be two or three deep cuts. There was no kind of danger in this proposals. Moreover this was the proposal in the sanctioned estimate for Rs.17.75 lakhs. The only serious objection to this proposal would be the loss of command involved in dropping the channel from 20 feet to the extent of 3000 acres. Deducting about 500 acres for village reserves, the actual loss in extent was about 2500 acres. Apart from this it had no other defect and was cheaper by Rs.50 lakhs and could be executed without any construction difficulties. He said he would still press for the dropping proposals and in case this was not adopted he would prefer the alternative to take the channel over the bund by means of a trough.

The Secretary, P.W.D. desired to know whether it would be possible to examine the nature of the soil and determine the strength of the bund to take the extra load of the R.C.C. trough by putting in trial pit. Secondly it would be interesting to know what would happen to the proposed siphon or the acqueduct if the bund of the tank breached. Thirdly it was stated that in the event of a trough being constructed over the bund there might be leaks in the expansion joints. It would be necessary to examine if these leaks can be prevented by putting in steel pipes at intervals. If the difference in cost between the trough proposal and the siphon arrangement is comparatively

small then the choice would lie between adopting a conservative method of proceeding with the work and the novel way of executing the work. It was understood during the discussion that the siphon proposal could be made fool-proof whereas the alternative regarding the trough was open to risk. The question to be considered was whether from the technical standpoint a foolproff method should not be preferred to the alternative which involves certain amount of risk. Mr.Rangaiya here observed that there was no question of any alternative being fool-proof. The question is only which is the least risky one. Since there was no unanimity of opinion among the members there were two alternatives before the Committee. One was to leave it to Government to come to a decision keeping in view the opinions expressed by members. The other alternative was, this being an important technical issue, to conduct further experiments about the strength of the bund by putting in trial bores and other methods and see if the members could not come to an unanimous decision about the proposal.

The Superintending Engineer said that trial pits cannot be sunk immediately as the reservoir was full and the soil would be most. Unless trial pits are taken up to the river bed, the safety of the bund cannot be determined. Further there were some trees in the neighbourhood of the bund. The roots of the dead trees extending into the bund would decay. The decaying material would be eaten by borrowing animals which get into the bund by burrowing and making holes in the dam which may give rise to leaks.

The Chairman said that he would prefer the Committee going into the question once again after trial pits are sunk and the whole question being re-examined with a view to seeing if the committee come to an unanimous decision on this point.

... has observed that the decision of the
now
the in 1947, has no bearing. I maintain that
it has a bearing, in that the Consideration in 1947
was not the depth of cut but the avoidance of the old bend
as the raising level by 10 ft was fixed
and town. They state that alternative of taking the Channel
in rear of the town bend will completely avoid the town
It is not a hill saddle and it is a man made bend
with all the risks inherent in the making of the embankment
and in the life of the bend.

It is stated that novelty need not deter mysore Engineer
I am proud to be a mysore Engineer. Mysore Engineers
have carried out the most efficient methods of execution
of Works - Dams, Jewel filters, were all their and there no
new Venture as in the proposal.
No Bund can stand if the half is washed yes. The trough
will not the keeps. This is an assumption not borne out
by any of the breaches of tanks. Nothing will
stand against wraths of nature. What will be of the
bund will go in trice: when the bund starts slipping

Mr Rangayya apprehends danger; recommends
strengthening and series in weir to lower the
level. Is it is not inviting difficulties and
raised
and then trying to solve them. (1)

Mr Jenghad has stated that nothing would happen
with an open excavation. I can only refer to the
remarks of Major Irrigation. It will indeed be dipping
Chief Engr
and it is endangering the safety of
the bund

Regarding the traffic arrangements &c. I bow to his
Capacity, but I wish to recall to his mind that it
is not a Concrete road laying in level ground without occupying
a month, while this Work is to be taken in hand and the structure
in the Bottom and struts, will hardly leave any space
in the 45 mid link the letters as ~~intended~~ stated already

Team of Power and Irrigation plans, have observed ~~the~~ the
Bund
the proposal has the advantage over Syphon. The
First. The Bund proposal leave the Sulekere Tank
certainly as members themselves can see.
undisturbed. If any proposal ~~have~~ leave the Sulekere Tank
this
proposal better and the bund. will ~~cannot~~ not touch
the bund or the bank. B

Secondly the bund proposal is the cheapest practical
proposal. Here too it is not practical ~~and~~ this unusual.
Practical, generally used is the Syphon, easy of execution
no risk, and in the trial any lis. the Syphon ~~is~~ ~~is~~
well be the cheapest (as I have shown already)

Thirdly the bund proposal does not involve any
difficult Construction such as the aqueduct or Syphon
across the Sulekere Valley which would take at least
two years for completion and Consequently the date
of opening the branch Channel can be advanced by one
full year. I am sure the members will not agree with
this. ~~The~~ Sulekere Valley is not a stream. Be explained already
across a
the bund proposal is the Construction of R.C trough
with difficulties of Construction due to the working
limited
space, lead and lift while the Syphon is a straight
forward and open work with large working space of
this Syphon takes two years. I will certainly
challenge (at the Bund proposal will take
double the time with the circumstances

Tide Retarded in Hooghly

I strongly support Mr Ananthakrishnan. The more I ponder and reflect, the more and the more, I am convinced that the proposition of taking the channel on an old bank round the bund is a very unsound one. The results of the recent tests are reported by the Superintending Engineer, reveals a very unsatisfactory Core of the bund and ten thin Risdaments made from time to time by the project officers to which I will presently refer. Confirms my fears of the risk involved in disturbing the old bund and that the decision of the Committee in 1947 for leaving the bund intact and for taking the channel behind the bund is correct. I have followed closely the remarks made in the previous meeting and (this meeting). I feel that some have made by the opposition to bund proposal clear the manifold, distinct advantages the bund proposal has over the work behind the bund, either in facility of execution, in risk and safety or in cost though cost is a subsidiary consideration, where safety is involved. The bund proposal on a Tana with a South depth in front, is very unusual one in the Engineering World as I have, heard or read. There are no such examples of Channels on Tana bund, while there are hundreds of Syphon crossing, in India and elsewhere, in Mayurakshi Grand Canal. In fact this is the most common method adopted in the crossing of railway line.

It will be necessary to know details of the bunds that have a bearing on the discussion of the merits. 1) The core of the bund as revealed consists of loose brown, bouldery soil (2) The Bund is 45 ft wide at the Left flank over 200 ft. and gradually widens out to 100 ft and 150 ft at the right bund 3) Both the Sluices are reported to be leaky. 5) they have to be used when the channel is dry; hence it can 4) The left sluice is on the small bund (e.g 45 ft.) be seen that the left flank and junction is the weakest and most Vulnerable portion of the bund. Here the ground below the tank is very flat with 1000 cusecs upto Alapakam Valley. It is not a hill tank. It is fed from the Sadda

✓ Owing to this proposal, I have all along maintained that the bund is not safe as it is now. But the introduction of structures by excavating on the bund 30 x 11 is a potential danger, engendering a situation favourable to the formation of leaks, by flow channels from the tank and leakage from structures i.e. from leakage at the bund. Rock blasting, excavation and concrete construction. The large number of decayed roots serves as capillary tubes inducing leaks under pressure. This creates a State for the breach of the tank. In a trice no matter what the width may be. Seepage and leakage in R.C. concrete will damage the base on the bund proposal. while R.C. cut-offs are Cracking will not do any harm. They will be leaks in a water supply line. It will be very easy. ✓

Let me note here the serious apprehensions of experienced Engineering project officers. Mr Ramaswamy Iyengar, Chief Engineer Major Irrigation, South, and Deputy Chief Engineer

Thus This surpasses aggravated the [illegible] in the Service.

Let me also express my own appreciation of the proposal approved by Mr Rama Swamy Iyengar Superintending Engineer. Mr Rama Swamy Iyengar, Superintending Engineer, Madras Irrigation South, and it may surprise some members. Mr Rama Swamy Iyengar, while discussing the Several alternatives in the first meeting, when he was observed with the idea of dropping, has written as follows.

The Contour up to the left abutment of sullurpet Tank runs in very difficult Country, along the foot of the hills as to be connected practically in the water spread of tank at its approach to the left abutment of the Sullur tank. It is extremely dangerous to cut open the bund for passage of Channel 3/4 with such huge carrying capacity and let in water in the hill just close of the tank which would cause dangerous percolation and piping, breach the tank is specially as the hill strata are formed and interspersed with earth, and the rock is steeply dipping downstream the Valley. Again as he stresses in another place in the same report, the huge canal has to cut through in an R.C.C Duct, the left hill abutment of sullurpet Tank is formed of soils, with strata dipping badly downstream on precarious steep hill slopes, which are liable to dangerous slips. When deeply trenched down vertically to accomodate huge channel section, at low levels the Canal will make the left hill abutment of the tank deep with water and induce danger piping Conditions, and may seriously endanger its existence (vide Pages 7 and 9 of his report regarding alternatives)

This was his view in October 1956. The left hand abutment about the potential danger of this nature of canal bund

This was his opinion in 1956. I can not certainly use stronger words than these about the potential danger, nor do I am however dismayed and confused in my mind by the attitude of this officer all the way between 1956 and July 57 which remains the same. I have this to members themselves to change it. The Superintending Eng and Mr Raju has expressed in a large note his fears and concludes "Tarra bund is not safe for carrying a water duct." X

The same officer writes as follows about in his note which he sent with the alternative proposal of trough over the bund. The bund of centuries old is a problem. There have been large trees standing on the bund with deep roots in the bund proper. Effect all trees are temporary and they must die after some time, when the roots decay and give room for pockets in the bund.

In the face of the serious apprehensions of the project there to be continued that the bund proposal under consideration and in the full knowledge of the causes of the breach of the tanks and in the nature of R.C hence not water tight, I submit that it is not wise to take the channel on the tank bund as it involves great risks. best to leave the bund untouched as per decision of Committee in 1947 at Ashby Canal problem. Hence now and try to solve them. Besides the great risk involved - Whether the main will be safe under the pressure and working difficulties are to be met even of working spares, the difficulty of negotiating traffic. Necessitating a heavy cut diversion, not tolerance and elasticity in execution. All these uncertain factors render it most costly than what is estimated.

The adoption of the main project given is subject by this trough over left bank as per [illegible]

Mr.

While the bund proposals is a risky, with difficulties during
execution, this Syphon Crossing is the safest, straightforward
work, with no problems of execution. [illegible] for
freedom of action, no uncertain factors. To Contend, the large working
space no interference of traffic, with equal cost as estimated.
it will certainly be less than estimated. While the bund proposal
is very very risky, unusual heavy bye-pass excavations
and (very uncertain factors) and lot of unforeseeables. Enormous
& more costly too than estimates. Why venture on a risky thing
when there is a very safe straight work as straightly observed
by the Secretary P.W.D. I [illegible] impress again that this Syphon
Cross will be behind the bund is not across any live stream at
is against a low dip - No problems of water ways, floods, etc.
to engulf that extravated.
no drainage of stream. Separate waterway required is provided
for the Sullerus River Stream with all the protections. The structure
will be above to structures constructed and under construction
between Tippagondanahally dam. or Structure in Mancepal
and between Dharmambudi Tank or Structure
between Sampige Tank. Structure can be laid as an framed through
as design through laid just the no bund
in the proposal, by this the design is [illegible] in the eventuality
of danger to the bund. Think Blocks, Picks 40 ft deep with safe
92° (1882 : 1182 : 102 : 5/12 : 1 Head

(Before I Conclude I wish to answer the observation
made in the previous meeting)

All the advantages claimed for the Tenin for the
bund proposal will be valid and also for Syphon
crossing and not for bund proposal.

After all these the question may be posed.
What will happen if the bund breaches some time
as old bunds have breached without warning?
If the bund breaches there will be no time, no
trough and we have to construct the Syphon proposal
which will take at least one year even on the rush
basis and all the 90,000 acres beyond will become
no vale, while the Syphon proposal, as designed
laid as proposed and anchored at the end by two thrust blocks
(the vale will flow over the Syphon and spread out
flow over the field without any concentration.
The present flow from the waste weir is 600 to 1000 cft.
No scour
No
It is 600 to 1000 cft.
No scour is left.
There will be no damage to the structure and any
There will be no stoppage
of supply to the owing area beyond at any time as this
is protected by Syphon
will all
to my friends.
and to my service
and other places. I beg to submit that the Syphon
proposal, is the best, economical, with no
the usual methods and is the safest involving no risks
while the proposal has not any advantage over Syphon and
is adopted it will be tragic and will
risks and. I am
for a fraction of this bund proposal.

I am strikingly once again struck that this syphon proposal is the best and most economical one and as designed it will stand undamaged in the eventuality of the breach of the bund. The present proposal of leaving two tube ducts instead of the one as originally proposed is very efficient and may be adopted (since) (5

BRC

It was resolved:

" THE COMMON PORTIONS OF THE WORKS RELATING TO THE SEVERAL ALTERNATIVES BEFORE THE COMMITTEE, NAMELY THE WORK ON THE MAIN CANAL UPTO THE POINT R1 IN THE PLAN AND THE MALEBENNUR BRANCH CHANNEL FROM THE POINT R2, ABOUT WHICH THERE IS UNANIMITY OF OPINION AMONG THE MEMBERS MAY BE PROCEEDED WITH.

REGARDING THE ALTERNATIVE PROPOSALS FOR CROSSING THE SHANTISAGAR VALLEY, THE COMMITTEE CONSIDERED THAT IN VIEW OF THE DIVERSITY OF OPINION AMONG THE MEMBERS, THE POSSIBILITY OF ARRIVING AT AN UNANIMOUS DECISION WITH REGARD TO THE PROPOSAL MAY BE FURTHER EXPLORED. IT WAS AGREED ~~XXXXXXXXXXXXXXXXX~~ THAT TRIAL PITS MAY BE DUG ON THE BUND OF SHANTISAGAR (ADHERING AS FAR AS POSSIBLE TO THE ALIGNMENT OF THE PROPOSED R.C.C.DUCT) WITH A VIEW TO INVESTIGATING THE NATURE OF THE SOIL AND TO DETERMINE IF THE BUND IS CAPABLE OF TAKING THE PROPOSED TROUGH. THE RESULTS OF THE TRIAL BORES MAY BE PLACED BEFORE THE COMMITTEE AT ITS NEXT MEETING. THE QUESTION OF TAKING THE DUCT IN THE REAR OF THE BUND INSTEAD OF IN THE FRONT AS NOW PROPOSED BY SRI M.G.RANGAIYA MAY ALSO BE INVESTIGATED. MODIFICATIONS IN THE ESTIMATE SUGGESTED BY SHRI. GANGADHARA MAY ALSO BE LOOKED INTO. MODIFIED PLANS AND ESTIMATES IN THE LIGHT OF THE OBSERVATIONS OF THE COMMITTEE TOGETHER WITH THE RESULTS OF TRIAL BORES MAY BE CIRCULATED AMONG THE MEMBERS WELL IN ADVANCE OF THE NEXT MEETING."

(3) Note on the right and left abutment of the dam.

The Secretary of the Committee said that the Superintending Engineer had written a letter to the Chief Engineer, Major Irrigation(South)on the abowe subject and had sent a copy to him. When the Chief Engineer was asked whether the Superintending Engineer's note should be circulated among the members he said that

it need not be done as the Committee had already taken a final decision on the point.

The Superintending Engineer explained that at the time decision was taken by the Committee he had expressed the view that the rock met with on the left flank was soft and could not take the load of a composite dam but the Committee took a decision about the composite dam. Subsequently samples taken had proved that his apprehensions were correct and therefore he desired that the question may be gone into by the Committee again.

Shri Gangadhara said that the committee took the decision to have a front masonry wall with earth backing at a time when excavations had not been made at the flank end. Now that it has been done and no rock has been met with. The Superintending Engineer wanted the question to be re-examined and there was some force in what he was saying.

Shri Narasinga Rao was of the view that both the notes furnished by the Superintending Engineer, indicated that the soil met with was poor, and the S.T.A.C. in taking a decision had taken all the aspects into consideration. Only thing to be done now as to avoid the fissures.

The Secretary, P.W.D. expressed the view that apart from technicalities and procedure, since the object was to have a sound structure, it might be desirable even at this stage to go into the question of left abutment. once again and resolve the doubts expressed by the Superintending Engineer.

It was accordingly resolved that the members might inspect the left flank once again as early as possible and come to a decision on this subject.

(4) NOTE ON THE MASONRY FOR THE FACE OF THE BHADRA DAM.

Shri. Gangadhara was of the view that this cannot be considered a minor point as opined by the Planning Commission Team as the spill way was a most vital part of the Dam structure and was an important matter. He said that to withstand the negative pressure long stones of 5 feet

Team as the spillway was a most vital part of the dam structure and was an important matter. He said that ~~xxxx~~ to withstand the negative pressure long stones of 5 feet used were quite necessary. He was of opinion that tapering the stones should have been avoided and that instead of having reinforced wide joints at extra expenditure, mere thin joints would have been preferable.

~~Shri~~ Narasinga Rao also expressed the opinion that great care has been taken against negative pressure. The trouble is that stones not properly dressed with slight variations would develop negative pressures. The design is as if the stones are imprisoned in a cage that during cavitation, the stones are not disturbed. As the negative pressures develop at every stage and not only at the top, the stone should be bonded at every stage. Longer the stones the better it would be. He suggested that the note of the Chief Engineer may be sent to the Planning Commission.

(H.Channiah)
Secretary,
Standing Tehhnical Advisory
Committee.

SV.

Proceedings of the Thirty-fourth meeting of the Standing Technical Advisory Committee held in the Chambers of the Minister for Public Works at 3-30 p.m. on 21st October 1957.

Present.-

1. Shri.H.K.Veeranna Gowdh, Minister for Public Works (Chairman)
2. Sri N.V.Iyengar
3. Shri.M.G.Rangaiya, B.A.,B.E.
4. Shri.M.Narasimhaiya, B.A.,C.E.
5. Shri.B.S.Narasinga Rao, B.A.,B.E.
6. Shri.M.N.Lakshmana Rao, B.A.,B.E.

~~xxxShrixxXxSxSaxxxadharxxxxBxE.~~

7. Shri.N.Neelakantappa, B.A.,B.E.
8. Shri.K.S.Gangadhara, B.E.
9. Shri.H.Ananthachar, B.E.
10. Shri.V.Ganesh Aiyar, B.A.,M.I.E.,M.I.M.E.
11. Shri.D.K.Srinivasachar, I.A.S. Secretary to Government, P.W.D.
12. Shri.J.L.D'Sa, B.E. Chief Engineer, Electricity Board
13. Shri.T.S.Moorthy, B.E. Chief Engineer, Major Irrigation (North)
14. Shri.C.R.Krishnaswami Mudaliar,B.E Chief Engineer, General and M.I.S.
15. Shri.H.Channiah, B.E. Under Secretary to Government, P.W.D. (Secretary)

Absent
Sri H. Anantachar

Agenda for the meeting - Cyclostyled Enclosures

---

(1) Confirmation of the proceedings of the 33rd meeting held on 10th July 1957 finalised at

---

The proceedings having been circulated among the members were taken as read and confirmed.

(2) Left Flank connections to the Bhadra Dam

The following decision taken at the preliminary meeting of the Committee held on 4th August 1957 was ratified:-

"The majority of the Standing Technical Advisory Committee members who inspected the spot recently are of the opinion that there is no need

~~to~~ alter

to alter the decision already taken ~~regarding~~ for adopting the composite Dam; Shri. Gangadhara however feels that a wing wall as indicated in the Plan along with the earthen dam even though more costly, would be preferable. Shri. Narasinga Rao and majority of the members feel that the slopes of the hill are too steep to build an appropriate earthen dam."

(3) Chickhole Scheme (Pl see enclosure B for the scheme as placed before the Committee)

The discussions and the conclusions reached at the preliminary meeting held on 25th September were brought to the notice of the Committee by the Secretary. and subsequent additions in T.S. made at the meeting of 20/10

~~Shri~~. The C.E., M.I.N. suggested that after meeting the requirements of the first crop and after providing for evaporation losses, water if any, available in the reservoir could be made use of for raising a second crop. He considered that this might be possible since ~~the water supply~~ water supply for the second crop becomes necessary only from the end of October or commencement of November ~~and~~ when the reservoir will be full ~~at that time~~.

Shri. Rangaiya and Narasinga Rao ~~were~~ said that this aspect was considered by the Committee and the members felt ~~of the view that this may not be possible~~ that the capacity of the reservoir as now designed ~~is~~ was not enough even to meet the requirements of a single crop, unless the capacity was suitably increased or irrigation was developed in stages by adopting a suitable crop pattern.

~~The scheme as~~ placed ~~before the Committee~~ might generally be approved

It was RESOLVED that ~~the estimate for the~~ project ~~may be~~ finalised having regard to the ~~decisions taken at~~ minutes of the preliminary meeting on 25/9/57 and 20/10/57 and ~~administrative and technical sanction~~ (vide enclosure)

~~sanctions obtained therefor~~ without furthering referring the question to the Committee. The points raised by the C.E., M.I.N., may also be examined. -

4. Hebbahalla Project

The following decision taken at the preliminary meeting held on 26th September 1957 was ratified:-

"The Scheme as now placed before the Committee for Rs 15 lakhs may be approved subject to the following ~~modifications~~ conditions:-

(i) The spillage over the weir be reduced from 6 ft. to 4 ft. by suitably increasing the length of the weir;

(ii) Necessary provision in the design of the weir and the height of the bund be made for increasing in the capacity of the reservoir at a second stage for diversion of the flow from Taraka by constructing an anicut higher up across that stream; and

(iii) Necessary provision may also be made with regard to increase in the size of the vent of the irrigation sluices for developing future irrigation and also for feeding Kargala Tank.

The Committee further recommended that this project be sanctioned and the work proceeded with immediately as this is going to serve as an auxiliary project for Kabbini in rehabilitating the displaced persons on account of that project."

5. Hagaribommanahalli Project

The following decision taken at the preliminary meeting held on 20th October 1957 was ratified:-

"Subject to the remarks made by the members at the preliminary meeting held on 18-9-57, the scheme as placed before the S.T.A.C. is generally approved. With regard to the waste weir, the members agreed to the suggestion that a portion of the discharge may be disposed of through hood siphons, the balance being disposed of through automatic shutters. The Chief Engineer, Major

Irrigation (North) said that the exact proportion between the two modes of disposal would however be worked out by him and furnished to the members. This was agreed to.

The question of providing suitable protective works in the draft channel may also be examined by the C.E., M.I.N."

6 Sagare Doddasere Scheme (Endorsement II as per STAC)

This was not discussed since the C.E., M.I.S. had recommended to Government that on account of the commanded area overlapping with that of Kabbini project, this may be treated as a minor irrigation scheme. (Endorsement II)

7. Alignment of the Bhadra Right Bank Channel (Davangere Branch) for crossing the Shantisagara Valley.

Shri.Narasimhaiya said that this question was discussed at the last meeting of the S.T.A.C. and again at the preliminary meeting held on 20th October 1957. There were two distinct views held by members. One was that the channel should be taken behind the Sulekere bund by means of an acqueduct or by means of a siphon; the other was to take it by means of an R.C.C. duct over the bund. The members have not been able to arrive at an unanimous decision The position may be recorded in that manner without further going into merits as the question had been sufficiently discussed.

The Secretary P.W.D. said that at the previous meeting of the S.T.A.C. a decision was taken to the effect that trial pits might be sunk in the bund with a view to knowing the nature of the soil and the results be placed before the members. He desired to know if the members had discussed the question in the

light of the results obtained and what were the factual aspects of the test so conducted. Sri CRK The Chief Engineer, M.I.S. stated that trial pits were sunk to a depth of 20 to 25 ft. and that only boulders and loose earth were found and water poured on the soil would immediately disappear. He was of the view that it was not safe or desirable to construct a duct on such a foundation.

Shri.M.G.Rangaiya said that it had been explained to him that the bund consisted of only boulders and loose earth. Some of the members were feeling that the bund ~~as existing as at present is~~ was itself weak and if additional load ~~is~~ were put on it, it ~~will~~ would become weaker still. He considered this was not correct since the bund would become heavier with the duct over it and can stand the pressure of water much better. It would add to the stability of the bund if additional load is put on it and as already stated by him at the previous meetings there would be no danger to the bund. From his experience of over 50 years with ~~the~~ Sulekere tank bund he said nothing ~~can~~ could happen that would endanger the safety of the bund if a duct ~~is~~ was taken on it. The bund was a natural saddle. It had stood for centuries and would last for centuries. If the bund was leaky it would not have withstood the pressure of 50 or 60 ft. height of water. There might be boulders in the bund here and there. But there was absolutely no danger in taking the duct over it and he considered that it would not in any way endanger the safety of the bund.

Shri.Narasimhaiya said that the Chief

Engineer was ~~was~~ apprehensive about the proper foundation for an R.C.C. structure in the dam. This could be provided with a concrete bed and he was sure that the Chief Engineer would have executed a number of works over concrete beds. The other fear expressed was the possibility of a leak from the joints in the R.C.C. duct. He said that Mysore Engineers had done and can construct ducts without leaks and even if there should be leaks suitable arrangements could be made for draining off water leaking through the joints. He therefore considered that these factors need not deter the Department from undertaking the duct work which was simpler and could be satisfactorily executed by the officers of the Dept.

Shri.Narasinga Rao stated that he had not been contending all along that the bund is not safe as it exists now but the introduction of a structure by excavating a trench on the bund of 30' x 11' was a potential danger engendering a situation favourable to the formation of leaks by flow channels from tank side and from leakage from R.C.C. structure if not both during execution and construction. The huge number of decayed roots serves as capillary tubes inducing leaks under pressure. This creates a state for breaching of the tank in a trice no matter what the width may be. Seppage and leakage in R.C.C. in bund will damage the base in the bund proposal while R.C. in low and crossing will not do any harm. They are leaks in a water supply line which will be only a waste.

It was necessary to consider here the serious apprehensions expressed by Shri.Ramaswami Iyengar the previous C.E.,M.I.S.

the previous Chief Engineer, M.I.S. While discussing the several alternatives in the first meeting, when he was in favour of the dropping proposal he has said "The contour up to the left abutment of Sulekere Tank runs in very difficult country along the foot of the hills as to be cover ducted practically in thewater spread of Sulekere tank at its approach to the left abutment of the tank. It is extremely dangerous to cut open the bund for passage of channelf with such huge carrying capacity andlet in water in the hill junction of the tank which would cause dangerous percolation and piping, breach the tank specially as the hill strata are fissured and interspersed with earth andthe rock issteeply dipping downstream the valley". Again he stressed in another place in the same report the huge canal has to through in an R.C.C. duct the left hill abutment of Sulekere Tank in fissured soils, with strata dipping badly downstream on precariously steep hill slopes which are liable to dangerous slips When deeply trenched downvertically to accommodate huge channel section, at lowlevels the canal will make the left hill abutment of the tank seep with water and induce danger piping condition and may seriously endanger its existence". The Superintending Engineer has in one of his notes expressed fears about this proposal and has concluded that the tank bund is not safe for carrying a water duct. In theface of the serious apprehensionsof the previous project officers that the bund proposal induces piping conditions, endangering the bund and in the full knowledge of thecauses of the breach of the tanks and with thenature of the R.C.C. being not water tight he considered that it was not wise best

to take the channel on the tank bund as it involves great risks and to leave the bund untouched as per decision of the Committee in 1947. A question may be posed as to what will happen if the bundbreachees. If such a thing happens there will be no tank no trough and we would have to construct the ~~xxxxxx~~ siphon now proposed which will take at least one year even on rush basis and ~~all~~ the ayacut of 90,000 acres beyond the sul-kere crossing will have no water. As against the trough proposal the siphon design is laid just below ground and is anchored at the end by two thrust blocks. This rests on piles diver 40 ft. deep over R.C.rafts of 2 ft. Even if the tank breaches ~~xxxxxxx~~ water will flow over the siphon without damaging the structure. There would be no stoppage of supply to irrigation. With the knowledge of the failure of tanks in Mysore andother places he was definitely of the view that the siphon proposal was the best, economical and the safest proposal involving no risks. On the other hand the bund proposal while not having any of these advantages over siphon proposal was fraught with grave danger and if adopted would be tragic and delighting in needless risks. He was emphaticaaly of the view that the siphon proposal was the best and economical and as designed it would stand undamaged in the eventuality of the breach of the bund. The present proposal of having two tube ducts instead of one as originally proposad was very efficient and he recommended that it might be adopted.

Further the 45 ft. left flank of the bund was very weak and the left sluice was also leaky.

Shri.M.N.Lakshmana Rao said that the results of trial pits were emphatically unfavourable to the duct proposal. It

had disclosed that the bund consisted of debris of loose filling/withe boulders and earth. So long as it was dry it would stand all right because of friction. Under the action of water when water soaks into the bund there would be danger to the bund. When an aqueous duct full of water is taken over the bund, one cannot be sure that such a duct would be water tight and if there were to be leaks it would endanger the bund and as such it was not desirable to resort to this proposal. On the other hand the proposal to take the channel in the rear of the bund had all the advantages. The bund would not be interfered with and the working conditions would be more elastic. There was also sufficient space for stacking materials. He was therefore in favour of taking the channel in the rear of Sulekere bund.

Shri Narasimhaiya said that he had already expressed his view all in favour of the duct proposal and he saw no reason to change his view even after seeing the results of the trial pits. He would advisedly refrained from referring to the recommendation of the Planning Commission Team on this question. But since the Chairman desired to know what the Team felt about it, he said that they were unanimously of the view that the channel should be taken over the bund. Even the members of the Consultative Committee were of the same opinion. The question had also been examined by the C.W.P.C. and they also considered that it would be advisable to take the channel over the bund.

have to be reconstructed as they were leaky and ~~fitting~~ the gaps would have to be filled up. It might take perhaps some years before the soil settles whatever the compaction may be.* The programme as now envisaged was to complete the whole project in another four or five years. If the duct proposal was adopted it might delay the completion of the project. ~~in~~ ~~If~~ ~~this~~ ~~delay~~ ~~and~~ ~~the~~ He was therefore of the view that if the time and the aesthetic view factor was no considerations, then the duct proposal could be adopted since it was more economical and feasible, of course after taking the precautionary measures suggested by him. The siphon would cost about Rs 20 lakhs more and if adopted would be independent of the tank. ~~proposal~~.

* Further there might be gaps or voids above the sluices section also.

XXX

Shri.Neelakantappa said that the Sulekere bund required attention on the part of the Government since it was one of the oldest tanks in Mysore and had to be preserved as an ancient monument. It would therefore be desirable to make the bund safe and take the duct over it. He added that a provision of Rs 5 lakhs made in the estimate for improving the bund was a provision worth its while. Further the proposal to take the duct over the bund was the cheapest ~~and involved no danger~~ as against the siphon proposal which would cost Rs 20 lakhs more. From the point of view of economy, working facility and also from the point of view of safey he considered there was absolutely no trouble in taking the channel over the bund and recommended that this might be adopted.

XXX Shri.N.N.Iengar said that it may be possible to consolidate the bund by clay grouting and take the duct over the bund.

The Secretary of the Committee read the following note (Enclosure IV) given by Shri.H.Ananthachar (who was not present for this meeting) expressing his opinion on the subject.

No decision could however be taken by the Committee. the Committee

(7) Review of the programme for Bhadra Reservoir works

It was observed by Shri.Narasimhaiya that according to the longitudinal section given by the department, the height of the dam would reach plus 98 by end of 58-59. He suggested this being raised by a few feet so that by June 1958 water may be stored in the R.B.channel. He further suggested that the Committee might pass a resolution in respect of the enhanced grants that are required during the years 58-59, 59-60 and 60-61 with a view to completing the project by the end of 60-61.

The revised programme was approved with the observation that increased grants to the extent of Rs 4 crores be provided in each of the years 58-59, 59-50 and 60-61 so that the project may be completed in all respects by the end of 1961.

(5) The progress of Tungabhadra ... as placed before the Committee was also approved

27/10